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PHYSICAL ACTIVITY IN COMMUNITY-DWELLING OLDER KOREAN-AMERICANS

by

Kyung Choon Lim

DISSERTATION

Submitted in partial satisfaction of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

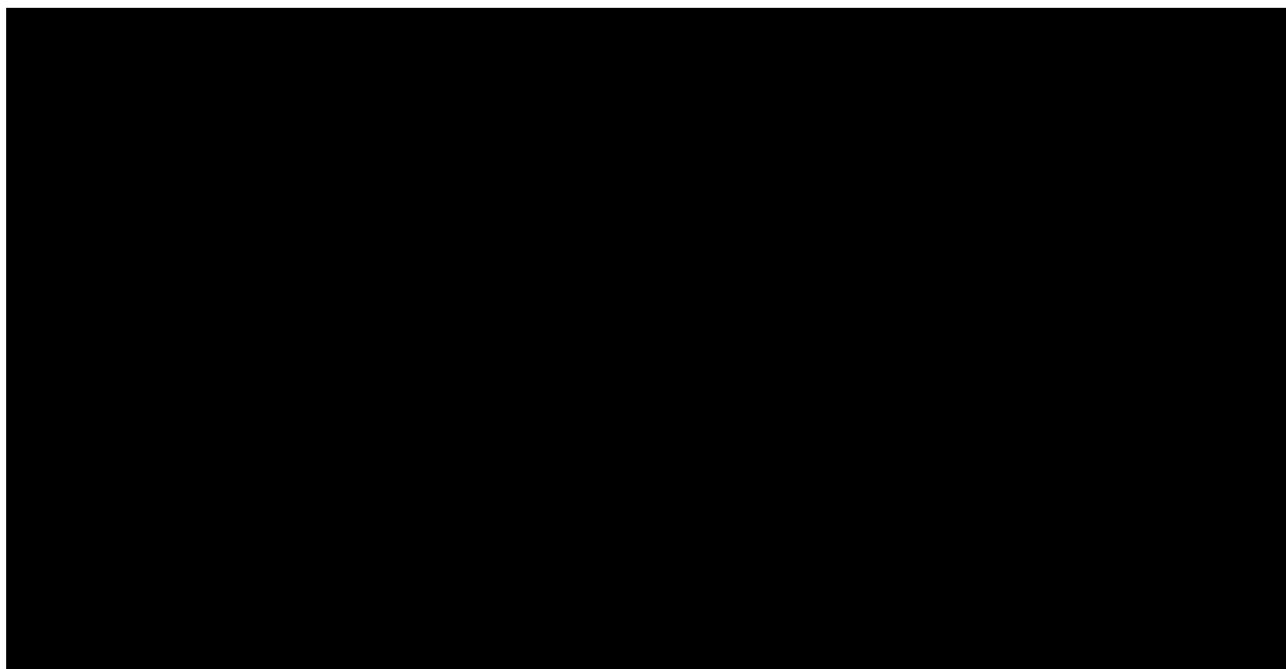
Nursing

in the

GRADUATE DIVISION

of the

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO



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by

Kyung Choon Lim

Dedication

This dissertation is dedicated to my husband, Yang Kyu Choi, my two sons, Jin Hyuk and Jin Myung Choi, my mother-in-law, Soon Ja Lee, my father, In Bong Lim, my mother, Bang Sim Song, and all my supportive families.

Acknowledgement

First and foremost, 151 participants in this study deserve my greatest appreciation for opening their lives to me and answering many questionnaires. They allowed me into their homes and shared their personal stories of life in America as well as in Korea. My thanks go to the Korean immigrant community in the San Francisco Bay Area who gave me information where I could meet older Korean-Americans and helped recruit participants.

My experience in caring for aged people began as an undergraduate when I was actively involved in a student association concerned with community health care, especially giving help to poor people. To find a way to improve the quality of life – physically, emotionally, socially, and politically – of the poor people, we regularly visited and worked with members of both rural and urban low-income communities that did not have access to health care. Many times I found that these individuals needed advocates to support their requests and resolve their problems. These experiences re-enforced my vision of the role of nursing in delivering the best care for patients and their families. I was convinced that research, evaluating particular health care needs like malnutrition and immobility, could be the most valuable resource one can offer to improve the health care of the aged who have been marginalized.

Through my work as one of the first clinical nurse specialists in South Korea, I realized the vital necessity of conducting carefully designed clinical research to analyze and evaluate the effectiveness in our clinical settings of nursing interventions that have been adopted from the West. I have also recognized that my desire to teach nursing students and to conduct larger studies aimed at the development of nursing

skills for chronically ill patients, especially older adults, would be greatly enhanced by graduate training in nursing at the University of California-San Francisco (UCSF).

For my doctoral study, I have chosen “physical activity and old age.” My clinical experiences for eight years with neurology patients have made me think about the importance of how mobility and independence affect individual’s quality of life in daily living. From my background, I always feel that health promotion and disease prevention are the best way to keep people healthy. As the proportion of the Korean population over age 65 in America has increased, physical activity is considered an important factor in preserving health and improving health-related quality of life in this group. In the first step of my journey as a nurse scientist, the most important interest is to describe the current level of physical activity in older Korean-Americans. This study will be a ground for the further step that will include the development of appropriate and enjoyable regular physical activity programs for this aged group based upon better understanding older Korean-Americans’ beliefs about and attitudes toward physical activity.

My deepest appreciation goes to my advisor and the chair of my dissertation committee, Dr. Jeanie Kayser-Jones. Since I met her at UCSF three years ago, she has provided tremendous support and led me to broaden my perspectives in gerontological nursing, particularly nursing home care. Physical inactivity and old age have been known as the part of risk factors in developing pressure ulcers, which I studied for my Master’s degree and for my advisor’s research on the trajectory of pressure ulcers in terminally ill nursing home residents. She has showed ceaseless generosity, advocacy, thoughtfulness, wisdom, leadership, scrupulousness, warmth, and scholarliness for my personal

development. Also, she has shown unswerving patience and understanding so that I could take classes in post-master gerontological nurse practitioner (GNP) program in addition to doctoral work. It was definitely a challenge for a doctoral student to balance doctoral research work and clinical training with study in the master program at the prestigious UCSF. Fortunately, I could complete both programs and was able to attain good experiences in several clinical settings. I greatly appreciate Jeanie's endless support.

Dr. Catherine Waters has been my research mentor regarding physical activity and has provided scholarly, social, and financial support in a tangible way. She chaired my qualifying examination committee and gave me insight into theoretical backgrounds of physical activity behavior and helped me integrate Korean's health belief system and Social Cognitive Theory. This integration was paramount in framing the final conceptualization. Working as her research assistant, I had many opportunities to discuss physical activity interventions with her data. She has guided me with her fine sense of humor, willingness to answer for all my questions, readiness to help and listen to me, thoroughness, humbleness, creativity, smartness, pliability, and wisdom. I am deeply grateful for her optimism and eternal encouragement.

Dr. Erika Froelicher, co-chair of my dissertation committee, critically read the dissertation and profoundly influenced data management and the interpretive component of this work. Her feedback on my paper was always filled with detailed suggestions and motivated me to be energetic about continuing to analyze the data and to rewrite many drafts. On a day that I gave her a revised draft, she used to call my home to tell me she was ready to have the next meeting with me to discuss it. Her enthusiasm, passion, expertise, insight, straightforwardness, novel conception and stimulation, theoretical

sharpness, flexibility, and respect in my ability helped me to engage in this study with confidence and finish the paper in a timely manner. My ongoing appreciation goes to her.

Dr. Grace Yoo covered the perspectives of older Korean-American in this study. Her insight provided great assistance in discussing older Korean-Americans' life in America and their culturally different belief system. Her thoughtful critique and comments, openness, vital encouragement, experiences of cross-cultural research, love, and caring are most appreciated with whole-heartedness.

It was fortunate for me to have these great scientists as my doctoral dissertation committee members. My doctoral work could not be accomplished without their careful directions, scientific advice, and sincere support. Also, I would like to thank Dr. Steven Paul, principal statistician at UCSF, for helping me understand the complicated statistical analysis and interpretation.

Lynda Mackin, associate clinical professor, has been my doctoral classmate and my advisor in GNP program. She has always supported my professional endeavors in the clinical and academic field. Lynda understood deeply why I took classes in the GNP program and arranged diverse clinical settings so I could learn more from different settings and preceptors. Also, she coordinated my schedules perfectly to complete coursework and clinical training required by California Board of Nursing within a year and half. I remain grateful for her constant support and concern.

Dr. Mi Soon Song, my advisor of master program in Seoul National University (Seoul, Korea), has encouraged me to continue doctoral study in gerontological nursing and achieve GNP certificate. Her far-seeing wisdom, passion, global

knowledge of her experiences, scholarliness, love, caring, and stimulation are most appreciated in a heart-felt way.

Many faculty members at UCSF and Seoul National University have strongly influenced me and my work as a nurse scientist. Their generous hearts, endless energy, and exciting research projects inspired me into my professional and intellectual development. My dear colleagues in the doctoral program and GNP program at UCSF have provided immeasurable support. They struggled with me for “survival” in every quarter with eagerness and scholarliness. We shared joys, sorrows, ideas, and personal development. We collaborated together for the group projects, studied together in the library as we prepared for exams, and supported each other. I am deeply grateful for their friendship and wish them well in their ongoing studies.

Without my family’s support and encouragement, this work could not have been achieved. My husband, Yang Kyu Choi, who has covered many roles to provide me as many hours as possible to complete this work was the most precious and wonderful supporter. He has been encouraging me to study at UCSF, taking care of our young children without me after returning to Korea, paying for the expenses of my study in the US, and fostering my belief and self-esteem by telling me how I am intelligent and valued. Finally, he is the only man who knows and loves me more than myself. He is my best friend and has led me with his broad vision, eruditeness, integrity, unbounded love, and sincere understanding since our first encounter in 1993. I am unable to adequately express how much I honor and love him.

My beloved two sons, Jin Hyuk, 10-year old and Jin Myung, 9-year old, have taken care of themselves and have sacrificed their personal desires and needs with

enormous patience for their mother's education and career goals without complaint. Whenever we talk through the internet using web cameras, they have always expressed concern about my well-being by asking what I was doing at the moment, what I was eating, what classes I was taking, which chapters I was studying, when I had exams, and what I was writing for my dissertation or publishing papers. I should mention here how much I love them and am proud of their strength in my absence.

My dear mother-in law, father, mother, seven siblings, sisters-in-law, brothers-in-law, nieces, and nephews have provided unswerving support, encouragement, and trust in my study to pursuing a PhD. It is unforgettable how much their numerous emails and phone calls made me happy and gave me comfort whenever I was tired and feeling small. Over the long haul, they have shown tremendous faith in my academic adventures. Their love and everlasting concern about me have helped me to overcome challenges.

Lastly, I would like to thank the Graduate Division, UCSF and the Century Club, UCSF School of Nursing for research awards as well as Regents Fellowships and Non-Resident Tuition Scholarships. Also, I greatly appreciate International Chapter P.E.O. Sisterhood; John A. Hartford Center of Geriatric Nursing Excellence, UCSF; William Randolph Hearst Foundation; Graduate Dean's Health Science Fellowships, UCSF; Dean of School of Nursing and Chancellor of UCSF; Margaret Andrews Nursing Fund; and William and Alice Hinckley Fund for their generous financial support during my doctoral study.

Upon completion of the PhD program I plan to be a research professional in a government agency or university; to teach nursing students at a university or

university hospital; to improve nursing interventions through clinical studies of chronic illnesses; and to continue research focusing on health promotion and disease preventive interventions for older adults. As a nursing educator and researcher, I want to provide proper guidelines of nursing for older adults in Korea or Korean-Americans and prepare nurses to provide appropriate nursing care for these groups in terms of disease prevention and health promotion. I believe that the graduate study at UCSF will prove invaluable to my future academic and research career in Korea. I am convinced that by combining my experiences and new knowledge, I can adjust them to advance nursing practice skills and evaluate the outcome of nursing activities to help older adults. Finally I believe that by doing this, my dream of helping others, through nursing care, will be fulfilled.

PHYSICAL ACTIVITY IN COMMUNITY-DWELLING OLDER KOREAN-AMERICANS

Kyung Choon Lim, RN, MSN, GNP, PhD

University California, San Francisco, 2005

ABSTRACT

Purpose: To describe the current level of physical activity and to explore the relationships between biological, sociocultural, and cognitive/affective factors and physical activity in older Korean-Americans.

Significance: Less is known about the barriers that are associated with maintaining physical activity or changing behavior from a sedentary to an active lifestyle among older adults from different cultural and ethnic backgrounds. As the number of older Korean-Americans rises in the US, it is essential to consider their overall health, health risk factors, and ability to be physically active within their social environment.

Design: Cross-sectional

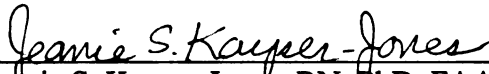
Methods: A convenience sample (n=151) was recruited from San Francisco Bay Area and interviewed using questionnaires for physical activity, perceived health status, acculturation, self-efficacy, social support, and depressive symptoms. The people who were either active or sedentary, 65 years of age or older, ambulatory, community-dwelling, and literate Korean-American were eligible.

Results: Average age was 77.5 (\pm 6.4) and 80.8% were female. 66.9% of our sample and 75.4% of older Korean-American women were less active than recommended public health standards. The preferred physical activity in our sample was walking. Being male, higher education, better health perception, higher exercise

self-efficacy, higher social support, and greater acculturation were statistically significant and positively associated with physical activity. Elders who had mild or severe depressive symptoms and more health problems were less physically active. Gender was moderately associated with physical activity, while education, perceived health status, social support, acculturation, exercise self-efficacy, depressive symptoms, and health problems were showed a weaker association with physical activity. Multivariate analysis showed that gender, social support, and self-efficacy were significantly associated with physical activity levels. Overall, approximately 26% of the variability in physical activity was explained by the 8 variables ($R^2 = 0.261$, $F_{8, 142} = 6.257$, $p < 0.01$). A logistic regression analysis showed that gender and self-efficacy were robust and associated statistically significantly with physical activity. Social support showed borderline significance.

Conclusion: Older Korean-Americans have lower level of physical activity than recommended public health standards. This study contributes empirically derived data on the factors that are associated with regular physical activity in older Korean-Americans.

Implication: Our results add to the science of physical activity and help in understanding factors that contribute to physical activity among older Korean-Americans. This information will be helpful when designing intervention to promote and maintain physical activity in Korean-Americans.



Jeanie S. Kayser-Jones, RN, PhD, FAAN.
Chairperson, Doctoral Dissertation Committee

This dissertation included five chapters; introduction, three papers, and executive summary of the study findings. The three papers are: **Aging, Health, and Physical Activity in Korean-Americans, Conceptualizing Physical Activity Behavior of Older Korean Americans: An Integration of Korean Culture and Social Cognitive Theory, and Physical Activity and Its Influencing Factors in Community-dwelling Older Korean-Americans.**

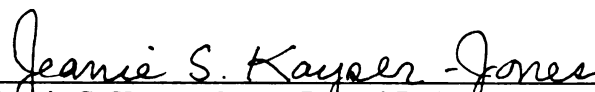
The first paper is a summary of the literature review. The purpose of this paper is to (a) provide a sociocultural context for understanding aging and health in Korean-Americans, and (b) examine the health benefits and sociocultural factors that influence physical activity in older adults with a specific focus on older Korean-Americans. The specific objective is to inform health care providers and explain how sociocultural factors affect health and physical activity in older Korean-Americans.

The second paper is a theory paper to give backgrounds related to physical activity behavior in older Korean-Americans. The purpose of this paper is to assess the social cognitive theory in relation to its relevance to produce cultural-specific directions for gerontological nursing practice in order to guide the design of physical activity interventions for Korean American elders within the context of the Korean cultural, social, and health belief system.

The third paper is the result of a descriptive, cross-sectional study in a sample of 151 older Korean-Americans. The purpose of the descriptive study is to describe the current level of physical activity and to explore the relationships between biological, sociocultural, and cognitive/affective factors and physical activity in older Korean-Americans. Subjects were interviewed using the 41-item Community Healthy Activities

Model Program for Seniors Activities Questionnaire, 2-item Perceived Health Status, 18-item Exercise Self-Efficacy Scale, 7-item Enriched Social Support Instrument, and 30-item Geriatric Depression Scale.

The purpose of three papers is to explore the influencing factors to physical activity in older adults under the theoretical frameworks and to describe current level of physical activity in community-dwelling older Korean-Americans. The last chapter provides executive summary of three papers.



Jeanie S. Kayser-Jones, RN, PhD, FAAN.
Chairperson, Doctoral Dissertation Committee

Chapter 2

Aging, Health, and Physical Activity in Korean-Americans

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As the number of individuals over age 65 with chronic health conditions increases, there is a growing concern about promoting quality of life (QOL) in later years. It is estimated that 12.4% of people in America are older than 65 and 1.5% are 85 years and above.¹ A significant number of these individuals, particularly those older than 85 years, have chronic illnesses and functional impairments and would benefit from regular physical activity (PA).² Across the lifespan, ethnic minority populations in America have relatively poor health and appear to be more physically inactive than Caucasians.³ Sedentary lifestyle is a recognized independent risk factor for the development of many health problems later in life. Yet, little is known about the health benefits and factors that influence PA among older adults from different cultural and ethnic backgrounds. The purpose of this paper is to (a) provide a sociocultural context for understanding aging and health in Korean-Americans, and (b) examine the health benefits and sociocultural factors that influence PA in older adults with a specific focus on older Korean-Americans (OKAs). The specific objective is to inform health care providers and explain how sociocultural factors affect health and physical activity in OKAs.

In the US, the proportion of the Korean population over age 65 has increased from 2.4% in 1980 to 4.3% in 1990, and 6.75% in 2000.⁴ As the number of OKAs rises in the US, it is essential to consider their overall health, health risk factors, and ability to be physically active within their social environment.⁵ Review of the literature disclosed that being physically active was rated lowest in health promotion behavior among OKAs⁶ and adult Korean immigrants.⁷ Immigration to another country and a new way of life affects immigrants in many ways. The changes that occur with immigration can influence the

way that people live and think as well as their personal health. Yet, there is limited knowledge about how immigrants adjust to a new environment.

Sociocultural Context of Aging and Health in Korean-Americans

Mass immigration of Koreans to the US started about 30 years ago and the number of Koreans residing within the US totals nearly 1.3 million.⁴ OKAs generally come to America on the invitation of their children, and they are expected to help with housework in their children's homes or with management of their children's small business.⁸

Sociocultural Context of Aging. Old age is considered one of the five great blessings of life in Korean culture. Older adults enjoy power and prestige, which are maintained by the frequently articulated Confucian virtue of filial piety that has long dominated the culture of the peoples of Korea, China, Japan, and other Asian societies.^{8,9} Filial piety is considered as "a natural and automatic sense of obligation to care for parents" (p. 90).¹⁰ The core of filial piety is to respect and care for older adults with affection, responsibility and gratitude, and the practice of filial piety has traditionally been the obligation of adult children.⁹

Aging-related role transitions consist of changes in family roles, social status and networks. Many Koreans are raised with the expectation that older people will be cared for within the family. The families of OKAs are expected to take on considerable responsibility in order to keep their elders comfortable, often providing all of their meals on a daily basis. It is noteworthy in intergenerational relationships that aged parents were found to have a lower level of exchange with their married daughters than their married sons. Cultural norms dictate that a married daughter belongs to her husband's family. The caregiving role of daughters-in-law is still predominant in the Korean-American

family, but this traditional norm is changing.¹¹ Increased longevity, the greater need and inclination for younger women, traditionally daughters-in-law, to work outside of the home, and decreasing adherence to “old country” values among second or third generation immigrants mean that an increased number of elders are being institutionalized against their will.

Korean-Americans are so aware of the cultural differences across generations that they not only have special words to describe the first and second generations, *il se* and *i se* respectively, but they have also given a name to the generation that was born in Korea and moved to the US before adolescence. This group is called *il chom o se* or generation 1.5. As expected, difficulties with identity issues, different perceptions of norms, and communication between generations are particularly common.^{11, 12} Older Korean-Americans are required to restructure their pre-immigration belief system, discard the traditional expectation of filial piety, and develop a maturational perspective firmly rooted in the changing reality in America.⁸

Sociocultural Context of Health. Cultural differences and lack of language proficiency are responsible for some negative late-life experiences of ethnic elders.¹³ For OKAs, the maintenance of harmony with the socio-spiritual environment is deemed central to the promotion of health and prevention of illness. Attaining one heart-mind-body (*il-shim-dong-chaе*) with humanity has been emphasized. The biological and psychological aspects of illness are interrelated; thus, it is recognized that excessive anger eventually led to liver damage.¹⁴ A perceived imbalance of the concepts of Yin and Yang can be brought about by either an excess or deficiency of a substance or activity. Opposing but complementary forces that control the flow of *gi* (vital energy) can account

for changes that are used to describe the nature and treatment of diseases. It is believed that only when the two are balanced with each other is the body considered healthy.

By keeping enough energy in the body, *gi* can help people to be physically active, resist illnesses, recover damage caused by disease, and balance the body's relation with the mind in addition to Yin-Yang balance. Also, it is believed that *gi* improves the function of body systems such as digestion, absorption, and immune system. Koreans rarely complain of anxiety, depression, or other psychological problems. Instead, even the description of anguish tends to be presented by bodily complaints rather than psychological or mental complaints.¹⁵ This concept, called *Hwa-Byung* (somatization in psychology), may be a culturally-patterned way of expression for Koreans perceiving and reacting to intolerable and tragic life situations that cause bodily symptoms by interfering with the harmony of *gi*.^{16, 17} Without a contextual understanding of cultural beliefs and values, OKAs' perception of their experiences cannot be adequately understood or interpreted.

Physical Activity in Older Americans, Koreans, and Korean-Americans

PA is one of the leading health indicators across the lifespan.¹⁸ The benefits of regular PA in older adults (see Table 1) are well known.^{3, 19-22} Yet, one third older men and 50% older women do not exercise at all.²⁰ Less than 30% of older adults are sufficiently active to achieve the full range of health benefits,²¹ and 70% to 80% of older women have lower levels of PA than the recommended public health standards.^{18, 23} In Korea, less than 10% of elders are engaged in regular PA,²⁴ and only 17% of adults exercise more than two times per week.²⁵

The Surgeon General's Report²⁰ and American College of Sports Medicine¹⁹ encourage all adults to participate in 30 minutes of moderate PA on most, if not all, days of the week (i.e., 5 or more days a week). PA is an umbrella term that includes all the types of exercise. The National Institutes of Health²⁶ defines PA as "bodily movement produced by skeletal muscles that requires energy expenditure and produces progressive health benefits," while exercise is described as "a planned, structured, and repetitive bodily movement done to improve or maintain one or more components of physical fitness" (p. 6). "Lifestyle PA is the daily accumulation of at least 30 minutes of self-selected activities, which includes all leisure, occupational, or household activities that are at least moderate to vigorous in their intensity and could be planned or unplanned activities that are part of everyday life" (p. 399).²⁷

Physical Benefits associated with physical activity. Functional decline is one of the major problems in old age. PA is considered an important factor in preserving health and prolonging life expectancy among older adults.²⁸ Even suboptimal adherence to moderate-intensity PA can yield health benefits.²² King and colleagues²⁹ found that a regimen of stretching and flexibility exercises resulted in statistically significant improvements in physical health and daily pain in comparison to a regimen of endurance and strengthening exercises in a sample of community-dwelling, sedentary women and men, aged 65 years and older over a 1-year period.³¹ In a study for older people,³⁰ greater levels of endurance and exercise participation were significantly associated with better ratings of physical health after 12 months of exercise program. Physical health was defined in terms of physical functioning, pain, and current health perceptions, regardless

of the intensity or format of the exercise program assigned; the number of chronic conditions was significantly and negatively associated with physical health.³⁰

Kim et al.³¹ examined changes in cardiovascular risk factors, health behaviors, and life satisfaction in institutionalized, Korean women, aged 60 and older. Following participation in a 3-month health-promotion program consisting of cardiovascular risk assessments, Korean traditional dance movements, and health education/counseling, the subjects had positive changes in cardiovascular risk factors and performance of health behaviors. Cholesterol levels and triglyceride levels were significantly decreased, but systolic blood pressure was not decreased. The association between body mass index (BMI) and PA in older adults is still inconclusive; additional empirical data concerning this relationship are needed.³² In a study by Stewart et al.³³ the percentage of body fat was the only independent correlate of anger mood state, bodily pain, physical functioning, and physical health. The mean obesity score (as measured by BMI) was significantly decreased at three months following a PA intervention, but increased again at six months.

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Psychological Benefits associated with Physical Activity. Investigators consistently report that measures of physical function and PA in older people are related to feelings of well-being,^{33, 34} cognitive function,³⁴ life satisfaction,³¹ and health-related QOL.²⁸ Koltyn³⁵ found a significant positive association between PA level and QOL in older women, indicating that even some activity is better than none and more is better than less. Observational studies generally show that more active older adults report higher levels of well-being. However, the results from randomized intervention studies of exercise training do not always support this relationship.³⁶ General psychological well-being was

not related to exercise participation levels throughout the year, and the number of chronic conditions was significantly and negatively associated with psychological well-being.³⁰

Perceived health status refers to personal beliefs and the subjective self-evaluation of one's own health in general.³⁷ Perceived health status has been found to have significant relationships with PA,^{31, 38} health-related QOL,³⁷ social support,^{31, 38} and chronic illnesses.³⁰ Health status and social support have been shown to influence self-efficacy, and self-efficacy has been shown to be related directly to PA.³⁹ The positive association between PA and health status has also been shown in Korean-Americans. One study⁴⁰ showed that Korean-Americans, 17 to 90 years old, perceived their health positively.

Depression is a common psychological response among elders and persons with chronic illnesses. Research has shown widely varying rates of depression, ranging from 2% to 60%, in older Korean adults. In a cross-cultural study comparing depression between older Koreans and older Americans over the age of 60, poor health was the most salient predictor of depression in both older Koreans and older Americans, while old age and lower educational level predicted depression in older Americans.⁴¹ PA has been shown to have an inverse relationship with depression and less social support and life satisfaction among older Koreans.^{24, 42}

Gender Difference. Self-reported health was significantly related to gender. Women perceived their health more negatively than men⁴⁰; women reported poorer physical health and somewhat poorer psychological well-being.³⁰ However, King and colleagues reported in a randomized clinical trial study that there was no significant gender or gender by group interactions in physical health and daily pain after a 1-year exercise

program.²⁹ Both men and women who were more acculturated into American society were likely to perceive their health more positively.⁴⁰ Women reported more depression than men.^{24, 42}

Sociocultural Factors and Physical Activity in Older Adults

To counter the effects of inactivity and achieve desirable health outcomes, people must adhere to regular PA.⁴³ Research has shown that without intervention most people remain sedentary or insufficiently active. Among young and middle-aged adults, knowledge, attitudes and beliefs, intention, expected benefits, perceived barriers to PA, social support, and self-efficacy have been shown to influence PA, but these sociocultural factors have not been well studied in older people.⁴⁴ Commonly identified barriers to PA for older adults are poor physical health and functioning, lack of motivation, confidence and skill, non-supportive social and environmental factors, and lack of cultural opportunities to be physically active (See Table 2).^{43, 45-47} In a study of recreational PA levels in healthy older women, independent risk factors for non-participation in PA were fear of falling, obesity, and slower times on the timed up-and-go test.⁴⁸

Clark²¹ examined the relationship between PA and specific subcultural characteristics in African-American and Caucasian men and women, 55 to 70 years of age. The preferred PA by all groups was walking. Barriers and facilitators varied by gender, but were similar for African-Americans and Caucasians. Environmental barriers were as influential as physiological and psychological barriers. Barriers were numerous among women, including perceived ability, social discomforts, and bodily pain or fear of pain. Men discussed lack of motivation as their primary barrier, although shortness of breath was clearly an issue. Additional barriers to PA among older adults are subcultural

differences in language, ethnicity, education, and income.^{46, 47} Mouton et al.⁴⁹ compared not acutely ill community-dwelling ambulatory Mexican-American with European-American adults aged 60 years and older. Lower levels of education, male sex, higher BMI, lower annual household income, unmarried, and older age were associated with a lower level of habitual PA in older Mexican-Americans.

There has been no research that examines the relationship between acculturation and PA in OKAs. In a study by Lee et al,⁴⁰ after controlling for age and socioeconomic status, acculturated Korean-American men reported greater light PA than bicultural and traditional men. Acculturated and bicultural Korean-American women had significantly higher light activity levels than did traditional women. Acculturation was significantly associated with light PA by age in both men and women. In OKAs, health-promoting lifestyle behaviors (nutrition, interpersonal support, self-actualization, health responsibility, stress management, and exercise) appear to be influenced by perceived health status, self-efficacy, education, and socioeconomic status, but there was no relationship to age and gender.⁶ By contrast, Sung and Lim³⁸ found a significant relationship between health-promoting lifestyle behaviors and age. Social support has been shown to be significantly associated with PA in older adults.³⁹ Yet, almost no studies are available in which changes in PA are related to changes in role or social activities such as volunteer work, community activities, participation in social groups or hobbies and recreational pursuits.⁵⁰

Conclusions and Implications for Practice

Successful aging or maintaining a high QOL is composed of freedom from disease, engagement with life, and physical and mental competence.³⁵ Strong ethnic identity does

not necessarily imply low involvement with the mainstream culture, but it can reduce the level of OKAs' frustration and dissatisfaction with their life in America. Results from varied population-based, cross-sectional and longitudinal studies that assessed the relationship between aging, health and PA are relatively consistent in their findings (see Table 3). Many studies found a strong, positive relationship between PA and health benefits and a moderately positive, but sometimes, mixed association between PA and QOL among older adults.^{28, 35, 37} Subjective QOL varies for individuals depending on their life circumstances; some people consider their lives to be meaningful, satisfying, and enjoyable with the limitations of physical functioning, low income, and certain diseases.⁴⁵ Additional research is needed to clarify the association between PA and QOL and the gap between PA and actual and predictive QOL among diverse populations of older adults.

Nurses play an important role in ensuring the health of all the people who need help. When caring for older people, cultural differences and individual needs must be considered. When OKAs immigrate to the US, they face many challenges such as lack of language proficiency, separation from family, and adaptation to new environments. Unlike the majority of elders in the US, ethnic minority seniors confront barriers such as old age, increasing loss of a second language with age, and adherence to a minority culture. Oftentimes, they do not share a common political history, religious traditions, or community values with those around them. Moreover, interpreter services in the majority of health care institutions are ineffective, and health care staff members receive little or no training to understand ethnic variations in the perception of illness and health. Due to

lack of communication and the limitations of access to health care services, ethnic elders may be deprived of their fundamental right to dignity and personal autonomy.

Nurses are the patients' front line of care; therefore, they must be suited for critical thinking, effective patient advocacy, and ongoing experiential learning.⁵¹ Nursing is a human science, which requires knowledge and learning about what a person is. Nursing demands understanding of human beings as subjective, having self-interpretation and meaning, and deserving of treatment as a whole. This review paper gives health care providers information about Korean culture and how it affects health and physical activity in OKAs. The health benefits of PA are well documented. These findings, along with an understanding of Korean culture, are knowledge that is essential for nurses to consider when caring for OKAs. Utilizing this knowledge, nurses can begin to address and motivate OKAs to engage in health behaviors including PA as well as develop interventions that will help to improve functional independence and the overall health status not only for OKAs but also for all older adults in the world. When health care providers plan a PA intervention for OKAs to make them active, the strategies can be; first, assess their perceived health status in terms of Yin and Yang balance with flow of *gi* energy; second, assess the current level of PA based on context mentioned earlier to find any barriers; and third, prescribe individualized PA reflecting their own preferences and situation.

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Table 1. *Health Benefits of Regular Physical Activity in Older Adults*

Minimizing biological changes related to aging
 Reversing disuse syndromes
 Preventing chronic diseases
 Controlling and improving symptoms of chronic diseases
 Maximizing psychological health
 Increasing mobility and function
 Facilitating rehabilitation from acute and chronic illnesses

Table 2. *Sociocultural Factors that Contribute to a Lack of Physical Activity in Elders*

Non-supportive environmental factors
 Lack of motivation, confidence, and skill
 Lack of cultural opportunities to be physically active
 Lack of social support and social discomfort
 Differences in language, ethnicity, education, and income

Table 3. *Summary of Association Between Physical Activity and Other Factors in Studies of Older Adults*

Author	Design	Positive association	Negative association	No association
King et al., 2000	RCT*	Physical health, daily pain level, flexibility		
Stewart et al., 2003	Cross-sectional	Peak oxygen uptake, vitality	Bodily pain, total mood disturbance	Gender, body fat
Stewart et al., 1993	Posttest	Physical functioning, pain, health perception	Number of chronic conditions	Psychological well-being, gender
Kim et al., 2003	Pretest-posttest	Life satisfaction, perceived health	Obesity, cholesterol, triglyceride level	Systolic blood pressure
Mouton et al., 2000	Cross-sectional	Female, income, education, marriage	BMI, male, old age, chronic diseases	
Resnick & Nigg, 2003	Descriptive	Social support, self-efficacy, physical & mental health	Fear of falling	
Resnick & Pasco, 1998	Descriptive	Motivation, self-efficacy, standing balance	Lower extremity function, fear of falling, vision	Medical conditions
Bruce et al., 2002	Cross-sectional	Physical & cognitive function	Fear of falling, obesity	
Sohng et al., 2002	Cross-sectional	Perceived health, self-efficacy, education, income		Age, gender

* RCT: Randomized Clinical Trial

Chapter 3

Conceptualizing Physical Activity Behavior of Older Korean-Americans: An Integration of Korean Culture and Social Cognitive Theory (Short title: Conceptualizing Physical Activity Behavior)

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Abstract

Aim: The purpose of this paper is to assess the social cognitive theory in relation to its relevance to produce cultural-specific directions for gerontological nursing practice in order to guide the design of physical activity interventions for Korean American elders within the context of the Korean cultural, social, and health belief system.

Background: People can live longer and healthier lives by engaging in physical activity. A majority of the theories that have been used to guide physical activity research are at the intrapersonal level and do not take into account cultural, social, environmental, and developmental factors. In contrast, social cognitive theory presumes the interpersonal environment is critical in influencing one's behavior.

Methods: Social cognitive theory is compared to the Korean cultural, social, and health belief system and is analyzed and evaluated based on three criteria: assumptions of the theory, completeness and consistency, and essence of nursing.

Findings: Social cognitive theory lends itself to the development of physical activity interventions within the Korean culture, especially its concept of harmony or fusion between the person and the environment and its effect on the body. The reciprocal nature of these determinants of human functioning is important to Korean American elders, who revere collectivism and value aging. Within the Korean culture and as presumed in the social cognitive theory and the nursing paradigm, health promoting behavior, such as physical activity, is conceptualized as the desire for a higher level of health rather than a fear of disease as is proposed by other health behavior theories.

Conclusions: Social cognitive theory with the integration of Korean culture recognizes cultural, developmental, societal, and other external constraints that may help in formulating interventions and better understanding the limits faced by older Korean Americans in their pursuit of routine physical activity.

Key words: physical activity, social cognitive theory, older Korean Americans

Introduction

People can live longer and healthier lives and have a better quality of life, as well as delay the process of aging, by engaging in healthier lifestyle choices, such as physical activity (PA).¹ The proportion of Americans older than 65 years is 12.4%, of which 1.5% are 85 years and older.² These numbers are steadily increasing for the general U.S. population of elders, as well as for ethnic minority elders. In the US, the proportion of the Korean population over age 65 has increased from 2.4% in 1980³ to 4.3% in 1990,⁴ and 6.75% in 2000.⁵ More elders are living with chronic conditions as life expectancy increases, however, ethnic minority elders in the US have poorer health and are more physically inactive as compared to Caucasians.^{6,7} As a consequence, there is an increased demand for optimal, specialized, culturally-focused care for the older population that focuses on health promotion.

Cultural background and experiences influence the way that people live, think, and behave, as well as their personal health. Several theories and models have been conceptualized and tested empirically to address the complexities associated with human behavior, especially as it relates to PA.⁸⁻¹⁰ Most of these intrapersonal level theories, however, do not take into account cultural, social, environmental, and developmental factors. In contrast, social cognitive theory (SCT) presumes the interpersonal environment is critical in influencing one's behavior.^{1, 11, 12} PA interventions are most effective if they alter these underlying interrelated components that influence behavior. These components are posited to help researchers understand the complex dimensions of PA as it relates to healthy living and longevity.¹³

The purpose of this paper is to analyze and evaluate SCT^{1, 11, 12} in relation to its relevance to produce cultural-specific directions for gerontological nursing practice in order to guide the design of PA interventions for culturally diverse older adults, with a

particular focus on Korean-American elders. SCT will be compared to the Korean cultural, social, and health belief system and will be analyzed and evaluated based on the criteria recommended by Fitzpatrick and Whall¹⁴: (a) assumptions of the theory, (b) completeness and consistency, and (c) essence of nursing.

Assumptions of the theory refer to whether the concepts are congruent with a given cultural group's beliefs and philosophy and whether the theory can be applied across the lifespan, that is, whether the theory takes into consideration the developmental changes and processes that occur along with aging. Completeness and consistency refer to whether the operationalized concepts of the theory are congruent with empirical data and whether there are gaps or inconsistencies within the theory that may lead to conflicts and difficulties. The essence of nursing refers to whether the theory embodies the nursing perspective, philosophy, and understanding.

Background and Significance

PA is an umbrella term, which includes exercise. The National Institutes of Health¹⁵ defines physical activity as "bodily movement produced by skeletal muscles that requires energy expenditure and produces progressive health benefits," while exercise is described as "a planned, structured, and repetitive bodily movement done to improve or maintain one or more components of physical fitness" (p. 6). "Lifestyle PA is the daily accumulation of at least 30 minutes of self-selected activities, which includes all leisure, occupational, or household activities that are at least moderate to vigorous in their intensity and could be planned or unplanned activities that are part of everyday life" (p. 399).¹⁶

A review of the current literature shows that being physically active is rated lowest of the health promotion behaviors among older Korean-Americans (OKAs)¹⁷ and adult Korean immigrants.¹⁸ OKAs are minimally acculturated, regardless of the

length of stay in the US; they generally do not speak English; and they are not familiar with the American lifestyle and social system.^{19, 20} Culture is a vehicle for knowing, a connection between the outside reality and the internal knower.²¹ Culture is a learned, shared, adapted, and dynamic system. Cultural background can influence people's expressions and thoughts of health behavior, such as PA. Since an individual's lived experience is anchored within the context of his or her bio-psycho-socio-cultural world, values, attitudes, norms, roles, and beliefs are embedded in daily life for every human being. Thus, it is important for nurses and other health care providers to recognize the wide range of PA level among older adults from different cultural and ethnic backgrounds.

Ethnic identity connects individuals through perceived common past experiences and expectations of shared future ones. Lipson²² describes that it is "a sense of peoplehood, a consciously shared system of beliefs, values, loyalties, and practices that demonstrates identification with a distinct group" (p. 8). It entails a sense of common fate including expectations of common treatment, joint fears of survival or extinction, and beliefs about group worth, dignity, and recognition. OKAs tend to maintain their own ethnic identity as well as social and cultural ethnic ties regardless of length of residence in the US.²⁰ The Korean cultural, social and health belief system is their existence in the US, as it was in Korea. Understanding this belief system is essential, particularly for nurses working with OKAs, who are typically less acculturated than younger Korean-Americans. As the number of Korean and other ethnic-minority elders rises in the US, it is essential to understand their overall health, health behaviors, risk factors, functional ability, and ability to be physically active within their sociocultural context.²³

Korean Cultural, Social, and Health Belief System

The hidden metaphor of the Korean cultural, social and health belief system is collectivism, which is based on fusion or harmony.^{24, 25} Collectivism is explained by a collective sense of self, which is much more inclusive of wellness and has a closer interconnection between others and self. In the Korean culture, the maintenance of harmony with the socio-spiritual environment is deemed central to the promotion of health and prevention of illness. Attaining one heart-mind-body (*il-shim-dong-chae*) with humanity is emphasized and can be achieved with PA. There is evidence that there is a moderate, inverse relationship between PA and mood disturbances, such as depression.⁸ Pang²⁶ found that symptoms of depression in elderly Korean immigrants affect the healing process. This finding demonstrates the Korean belief that the social, biological and psychological aspects of illness are interrelated.

The transitions related to late-life events in Korean elders draw on both the perspectives of Buddhist philosophy and transpersonal/transcendent psychology.^{27, 28} This viewpoint captures effectively a part of older Korean Americans' thinking process because it integrates elements of Buddhism, a philosophy present in Korean culture for a long time. Confucianism, Buddhism, Taoism, and unique Korean cultural traditions influence Koreans' philosophical view of humans, nature, and health. These foreign thoughts were indigenized and intermingled with native thoughts.^{29, 30}

A perceived imbalance of the concepts of *Yin* and *Yang* can be brought about by either excess or deficiency of a substance or activity, for example, lack of PA or being sedentary. The assumption of traditional *Yin* and *Yang* theory is that human beings develop certain susceptibilities to disease or pathological factors but they manifest different symptom profiles even with the same disease because people has different types of *Yin* and *Yang* balance.³¹ Opposing but complementary forces that

control the flow of *gi* (vital energy) can account for changes that are used to describe the nature and treatment of diseases. While *Yin* (the shady side) represents old, dark, negative, cold in the body, moon, earth, and women, *Yang* (the sunny side) corresponds to young, light, positive, heat, sun, sky, and men.^{32, 30} It is believed that only when the two are balanced with each other is the body considered healthy. In Taoist philosophy, whole life is considered to be the circulation of *Yin* and *Yang* and all creation in the nature depends on their harmonious working.³⁰

An excess of either heat or cold can upset the balance, thus certain illnesses are classified as hot due to excess *Yang* in the body, while other illnesses are classified as cold resulting from a surplus of *Yin*.²⁵ The *Yin-Yang* balance as a fundamental unity can be affected by multiple variables such as climate, age, emotional state, and the cooling or heating properties of foods and herbs. Many of these factors have been shown to affect PA behavior^{8, 9} in older adults¹⁰ across cultures.¹³ In the Korean culture, *gi* represents vital energy that originates in the abdomen.²⁵ Thus, having a good appetite and eating is indicative of the degree of *gi* one possesses. By keeping enough energy in the body, *gi* can help Korean elders to be physically active, resist illnesses, recover from damage caused by diseases, and balance the body's relation with the mind in addition to the *Yin-Yang* balance. Thus, without the contextual understanding of sociocultural influences, older Koreans' perception of their health experiences and PA behavior cannot be correctly understood or interpreted.

Social Cognitive Theory

SCT presumes individuals are social beings who derive their sense of self and personal efficacy from others through interpersonal exchanges, and that the interpersonal environment is critical in affecting and predicting one's health behavior and, in turn, health outcomes.^{1, 11, 12} Unlike the other commonly used and known

health behavior theories, SCT operates at the interpersonal level. Similar to these models, SCT can be used to understand health promotion behavior, such as PA. The health belief model,³³ transtheoretical model of change,³⁴ and theories of reasoned action and planned behavior³⁵ are intrapersonal theories of health behavior that do not take into consideration one's sociocultural and environmental context.

SCT is a multidimensional framework that has its roots in the behavioral science of social learning theory, it is an expectancy value theory, and it supports the idea of a reciprocal determinism.^{1, 11, 12} Reciprocal determinism is the view that personal factors (e.g., cognition, affect, motivation, and biological events of the OKAs), behavior (e.g., intensity, frequency, duration, and type of PA), and environmental influences (e.g., Korean culture, socioeconomic status, education, and family structure) create interactions that result in a dynamic triadic reciprocity. The reciprocal nature of the determinants of human behavior makes it possible for intervention efforts to be directed at personal, behavioral, and environmental levels. Therefore, strategies for changing PA behavior can be aimed at improving emotional, cognitive, or motivational processes, increasing behavioral competencies, or altering the social conditions under which people live with their cultural context.³⁶

Bandura¹² advances a view of human behavior adoption and change that accords a central role to cognitive, vicarious, self-regulatory, and reflective processes—all of which play a critical role in people's capability to construct reality, encode information, and perform behaviors. People are viewed as proactive rather than as reactive organisms, shaped and shepherded by environmental forces or driven by concealed inner impulses. According to Bandura, human motivation and action are regulated by forethought. Cognitive control of behavior is based on two principles: (a) self-efficacy expectations—belief in one's capabilities to perform a course of action

in order to attain a desired outcome, and (b) outcome expectations—belief that a certain consequence will be produced by personal action.

Bandura¹² contends that people view specific outcomes as being contingent on the adequacy of their performance, therefore, they rely on self-efficacy expectations in deciding which course of action to pursue. Self-efficacy and outcome expectations are behavior-specific and dynamic, and theoretically, they are both appraised and enhanced by four mechanisms: mastery experiences that involve performance accomplishment; vicarious experiences; verbal and social persuasions through encouragement from experts and social support; and physiological and affective states such as joy, pain, fatigue, or anxiety associated with a given activity.

According to Bandura,¹¹ a mismatch between actual ability and perception of function exists; it is common for people to be more or less competent than they believe themselves to be, which is a human characteristic that figures prominently in SCT. The principle of self-efficacy suggests that the stronger an individual's self-efficacy and outcome expectations are, the more likely it is that he or she will initiate and persist with a given activity. Self-efficacy beliefs influence the type of activities a person chooses, the degree of effort, and the level of perseverance toward the goal, despite failure and adverse conditions. The principle of self-efficacy is based on the premise that individuals make judgments about their capacity to engage in a certain course of actions and behaviors or to produce desired effects or consequences. These judgments or self-efficacy expectations provide the bridge between knowledge and health behavior; thus, there should be a positive correlation between self-efficacy expectations and self-reported behavior, such as PA.

Self-efficacy to engage in PA is a common pathway of psychological influences and affects each of the basic processes of personal change.¹ Self-efficacy has been

shown to be a reliable predictor of PA maintenance over time in the general population and in older adults.^{37, 38} The foregoing assumptions of the SCT suggest that when individuals encounter information about PA, they differ substantially in the ease with which various expectancies, effects, goals, and self-regulated strategies become activated.

According to Bauman and colleagues,⁸ self-efficacy relating to PA serves as a mediator, moderator, or confounder in different contexts. As a mediator, participation in a PA program results in a change in self-efficacy that itself results in increased PA behavior. As a moderator (effect modifier), exposure to the intervention for people at different levels of self-efficacy would produce different effects; that is, high self-efficacy people may be more likely to change their physical inactivity behavior compared to those with low self-efficacy. As a confounder, self-efficacy is related to the outcome of participation in PA, but could also be associated with participation in the PA programs.

Analysis and Evaluation of the Social Cognitive Theory

Assumptions of the Theory

The SCT lends itself to the incorporation of PA within the Korean cultural, social, and health belief system, especially its concepts of collectivism and harmony or fusion between the person and the environment and its effect on the body (see Table 1 & Figure 1). The Korean's belief in one heart-mind-body (*il-shim-dong-chae*) harmony or fusion with the environment phenomenon^{24, 25, 30} is comparable to Bandura's^{1, 11, 12} concept of reciprocal determinism. Traditionally, attaining one heart-mind-body (*il-shim-dong-chae*) with humanity has been emphasized in OKAs.²⁰ The reciprocal nature of the determinants of human functioning is especially important for Korean American elders, who revere collectivism and value aging.²⁰

In addition, the maintenance of harmony or fusion with the socio-spiritual environment is deemed central to the promotion of health and prevention of illness in this group. Within the Korean culture, health promoting behavior, such as PA, is conceptualized as the desire for a higher level of health rather than a fear of disease. This, too, is true of the SCT in which threat is not proposed as a major source of motivation for PA intention and behavior, as it is in other health behavior theories, such as the health belief model.³⁹

SCT emphasizes that health behavior is rooted in cognitive processes and it influences decision-making.^{1, 11, 12} Expectations of self-efficacy, attitudes towards PA, perceived barriers to PA, and past behavior exert strong influences upon behavioral intention, which in turn influences overt behavior. The underlying assumption of the SCT emphasizes the active role of individuals in engaging and maintaining health behaviors at whatever developmental stage and in modifying the environmental context for health behaviors, which is congruent with the Korean cultural, social, and health belief system. The underlying assumptions of the SCT takes into account the value collectivism has on health and illness in the Korean culture so as not to “blame the victim” or place responsibility solely on the individual. Disentangling the importance of social norms, attitude, and perceived control beliefs is important for research with cultures where these factors are of little value. Cultures are diverse and dynamic social systems, and self-efficacy beliefs regulate human functioning in cultural embeddedness through cognitive, motivational, affective, and decisional processes.⁴⁰

SCT is a framework that can help identify what needs to be known before developing and organizing a PA intervention for OKAs. Because of its focus on environmental as well as personal factors, the SCT can provide insight about how to

shape strategies that encourage OKAs to adopt and adhere to regular PA. Differences between personal facilitators and situational barriers in SCT are likely to provide meaningful explanations of individual differences in regular PA.¹¹ Using SCT as a framework, a researcher can aim to improve older Korean's emotional states, correct faulty self-beliefs and habits of thinking (personal factors), improve knowledge and self-regulatory practices (behavior), and alter the physical, social and cultural milieus that work to undermine successful behavioral changes (environmental factors). Often immigration and developmental life changes affect social, cultural and environmental factors for OKAs who are in transition. Treating humans as thinking organisms enables investigators to understand fully why people behave the way they do.⁴¹ The reciprocal nature of the determinants of human functioning is especially important for Korean American elders, who revere collectivism and value aging. In addition, these underlying assumptions are congruent with the nursing perspective.

Completeness and Consistency

Currently, there is no behavioral theory or even a combination of theories that explain all of the influential variables that are correlated with PA behavior, especially across cultures and developmental stages. This implies that new behavioral theories that take into account existing data need to be developed or existing behavioral theories need to be evolved to incorporate emerging empirical data relevant to different cultural groups. A majority of the health behavior theories, while they can aid in understanding the correlates of PA in older, ethnic minority populations, they do so at the individual or intrapersonal level. Unlike the SCT, few of the health behavior theories recognize societal, cultural, organizational and other external constraints placed on the elderly that may help in the formulation of a better understanding of the limits faced by older Koreans in their pursuit of routine PA.

Dzewaltowski et al⁴² studied the prediction of four weeks of PA participation within the conceptual context of the SCT and the theories of reasoned action and planned behavior. They reported that the SCT's self-efficacy construct was a better predictor of PA behavior than the theory of planned behavior's perceived control construct and the theory of reasoned action's behavioral intention construct. Other researchers have reported similar findings for the predictability of SCT in PA research.⁴³ Bauman and colleagues⁸ reported that in the literature related to PA correlates in adults, the percentage of variance explained by variables of the SCT was 70% as compared to the health belief model which explained only 25% of the variance. Comparable to the SCT, the theory of planned behavior and the transtheoretical model of change explained 67% and 100% of the variance, respectively. This evidence is limited in relation to elders and culturally diverse populations.

One might argue that an intrapersonal theory, such as the transtheoretical model of change, might be an appropriate model to guide PA research as opposed to an interpersonal model such as the SCT, especially as it relates to relapse. For PA behavior, the highest likelihood for relapse occurs within the first 6 months of starting a program.^{9, 44} Weinstein and colleagues⁴⁵ believe that one can experimentally test if the distinction between stages is arbitrary and useful merely for description, or if true stages of PA behavior do indeed exist. Bandura¹² argues that the stages of change for PA merely reflect arbitrary pseudo-stages rather than genuine stages. Other concerns are knowing the minimum interventions needed to accelerate progress at each stage, accommodating slippage or return to the less positive behavior, and taking into consideration physical and social environments.⁴⁶

Bandura^{1, 11, 12} believes that human behavior is multifaceted and multidimensional. When people try to change their health behavior, they experience both successes and failures.⁴⁶ Some people may relapse after beginning a program, then restart; others may change abruptly their behavior. This cyclic process or bypassing of stages does not fit the basic tenets of change theory, which presumes that the process of change is unique at each stage and occurs in a linear manner. Bandura¹² posits that behavior cannot be sectioned at 6 months into different stages that propel an individual from one stage to the next stage simply because of the passage of time.

Self-efficacy beliefs help determine how much effort people will expend on changing behavior, how long they will persevere when confronting obstacles, and how resilient they will prove in the face of adverse situations based on knowledge of ethnic and cultural influences. As previously mentioned, self-efficacy has been shown to be a reliable predictor of current and future PA behavior as well as PA maintenance over time.⁸ Research on PA self-efficacy indicates that older adults are as competent as younger adults.¹⁰ Among older adults, low- to moderate-intensity PA appears to be as effective as vigorous-intensity PA for realizing improved cognitive and physical functioning, unlike younger adults whose health improvements are dependent on the intensity of PA.

Essence of Nursing

Both the SCT and the Korean's cultural, social, and health belief system embodies the nursing paradigm. Like the nursing paradigm, these perspectives encompass a competence- or approach-oriented model, however, they lack a unique focus on nursing science. An appropriate nursing perspective that focuses on health promotion and takes into consideration social context is Pender's⁴⁷ health promotion model. This model integrates nursing science perspectives on influencing health

promoting behaviors. It is an interpersonal model that provides a guide for exploring the complex biopsychosociocultural processes that motivate individuals to engage in behaviors directed toward the promotion of health (behavioral outcome), taking into consideration individual characteristics and experiences and behavior-specific cognitions and affect.⁴⁸ Health promoting behaviors are operationalized as health responsibility, PA, nutrition, spiritual growth, interpersonal relationships, and stress management.^{49, 50}

Conclusions and Implication for Practice

More studies that focus on intrapersonal, interpersonal, and social systems relationships to initiate and maintain PA behavior in OKAs are needed. Unlike the majority of elders in the US, ethnic minority older adults, especially immigrants, are limited in their ability to re-establish a sense of community with fellow residents.^{17, 18, 20} Most confront barriers such as old age, increasing loss of a second language with age, and adherence to a minority culture. Oftentimes, OKAs do not share a common political history, religious traditions, or community values with those around them.^{5, 25} Moreover, interpreter services in the majority of health care institutions are ineffective, and health care staff members receive little or no training to understand ethnic variations in the perception of illness and health.²³ Due to lack of communication, the limitations around access to health care services, the ethnic and immigrant elderly are deprived of the fundamental right to dignity and personal beliefs.

It is important for nurses and other health care providers to recognize the wide range of PA level when screening for health behaviors. Many studies identify the importance of PA for healthy aging, but little is known about which factors contribute to being physically active among older adults from different cultural and ethnic backgrounds. The relationships of personal, social, cultural, environmental, and policy

variables with PA among ethnic minority groups need to be explored. If nurses or other health providers understand OKAs' reasons for and barriers to including PA regularly based on the knowledge of theoretical frameworks for health behavior, then they can intervene more effectively to increase PA in this population. Future research focusing on SCT and PA in older Korean Americans within their sociocultural context will help to define nursing implications in this arena.

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Table 1. *Comparison of the Social Cognitive Theory to the Korean Cultural, Social, and Health Belief System*

	Korean Cultural, Social and Health Belief System	Social Cognitive Theory
<i>Philosophy/Assumptions</i>	<ul style="list-style-type: none"> ▪ Transpersonal ▪ Buddhism ▪ Taoism ▪ Confucianism ▪ Socio-spiritual 	<ul style="list-style-type: none"> ▪ Interpersonal ▪ Behavioral Science ▪ Social Learning Theory ▪ Expectancy Value Theory ▪ Competence/Approach Oriented ▪ Biopsychosociocultural
<i>Concepts</i>	<ul style="list-style-type: none"> ▪ Collectivism ▪ Fusion or Harmony ▪ <i>Yin & Yang</i> ▪ <i>Gi</i> (Vital Energy) ▪ One Heart-Mind-Body (<i>il-shim-dong-cha</i>) ▪ Health Promotion 	<ul style="list-style-type: none"> ▪ Health Behavior ▪ <u>Reciprocal Determinism</u> ▪ Person-Behavior-Environment ▪ <u>Self-Efficacy/Outcome Expectations</u> ▪ Mastery Experiences ▪ Vicarious Experiences ▪ Verbal Persuasions ▪ Social Persuasions

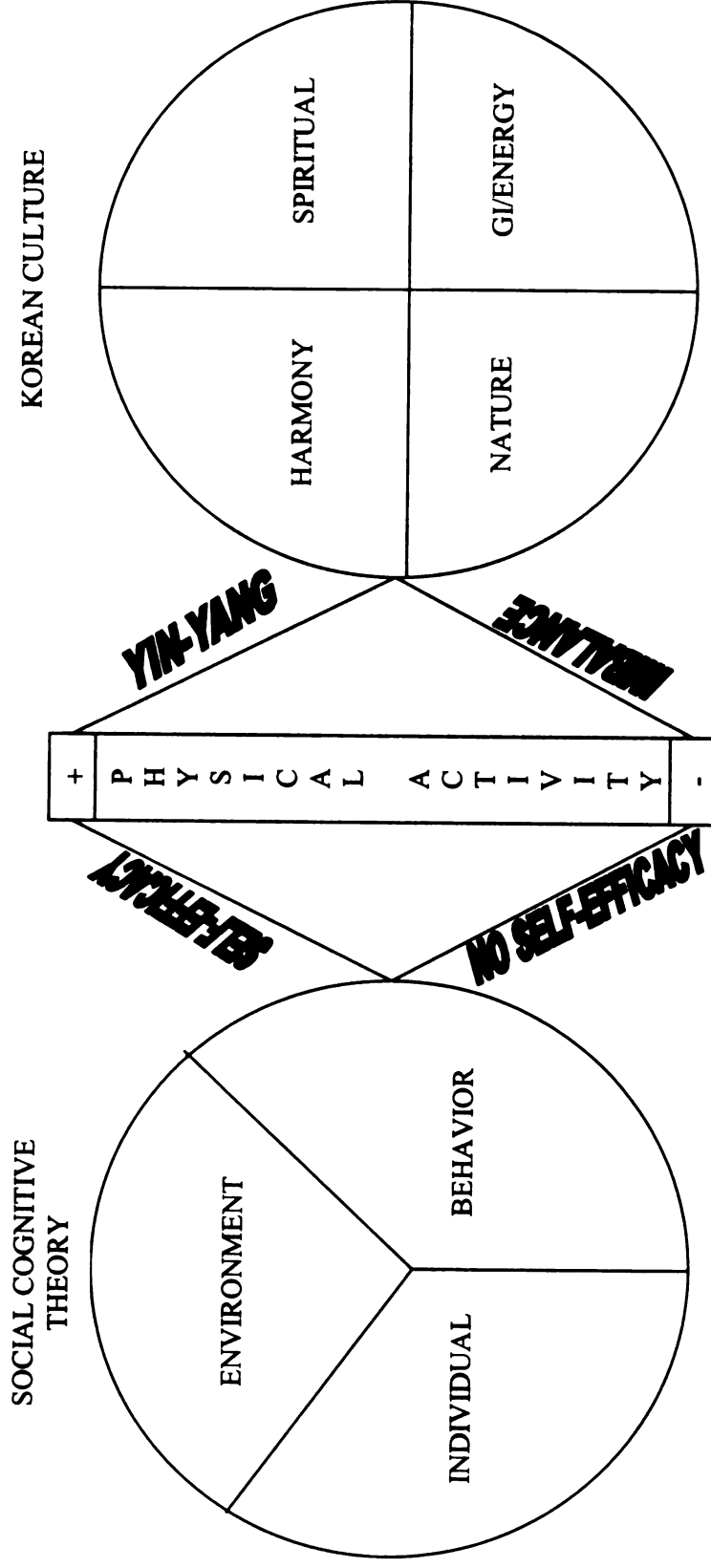


Figure 1. Symbolic Representation of the Integration of Korean Culture and Social Cognitive Theory

Table 2. *Summary***What is already known about this topic**

- People can live longer and healthier lives and have a better quality of life, as well as delay the process of aging, by engaging in healthier lifestyle choices, such as physical activity. Ethnic minorities, however, are less physically active across the lifespan as compared to Caucasian Americans.
- Cultural background and experiences influence the way that people live, think, and behave, as well as their personal health. Being physically active is rated lowest of the health promotion behaviors among older Korean Americans, who are minimally acculturated.
- Most of the theories that have been used to guide physical activity research are at the intrapersonal level and do not take into account cultural, social, environmental, and developmental factors. In contrast, social cognitive theory presumes the interpersonal environment is critical in influencing one's behavior.

What this paper adds

- This paper presents an analysis and evaluation of the social cognitive theory in relation to its relevance to produce cultural-specific directions for gerontological nursing practice in order to guide the design of physical activity interventions for culturally diverse older persons, with a particular focus on Korean American elders within the context of the Korean cultural, social, and health belief system.
- Social cognitive theory lends itself to the development of physical activity interventions within the Korean culture, especially its concept of harmony or fusion between the person and the environment and its effect on the body. The reciprocal nature of these determinants of human functioning is important to Korean American elders, who revere collectivism and value aging.

INTRODUCTION AND BACKGROUND

A significant number of older adults, particularly those older than 85, have chronic illnesses and functional impairments, and would benefit from regular physical activity (Resnick, 2001). Minority populations in America have relatively poor health and appear to be more inactive than their Caucasian counterparts (Kriska & Rexroad, 1998). In the US, the proportion of the Korean population over age 65 has increased from 2.4% (14,616) in 1980 (Koh & Bell, 1987) to 4.3% (34,248) in 1990 (Moon, 1996), and 6.75% (87,750) in 2000 (Yu, 2002). The number of Koreans residing within the US totals nearly 1.3 million (Yu, 2002) and 5.3% of Koreans in America live in San Francisco, Oakland, and San Jose (US Census Bureau, 2000). California has the largest population of Koreans with 33% of the total (Yu, 2002). As the number of older Koreans rises in America, it is essential to understand their overall health, health risk factors, functional ability, and ability to be physically active within their social environment.

Physical activity (PA) can be a method to increase their health perception, maintain independence within the context of their everyday lives, and to reduce their risk of diseases. Many studies identified the importance of PA for healthy aging, but little is known about what motivates older adults to become and remain physically active. Being physically active was rated lowest in health promotion behavior among older Korean-Americans (Sohng, Sohng, & Yeom, 2002) and adult Korean immigrants (Kim & Song, 1997). Therefore, knowledge about the level of PA in older Korean-Americans (OKAs) as well as their perception of motivators and barriers to PA is essential for health care providers to prescribe activities that will improve functional independence and perceived health status.

Definition of physical activity: Physical activity is an umbrella term, which includes exercise. The National Institutes of Health (NIH, 1995) defines PA as “bodily movement produced by skeletal muscles that requires energy expenditure and produces progressive health benefits,” while exercise is described as “a planned, structured, and repetitive bodily movement done to improve or maintain one or more components of physical fitness” (p. 6). “Lifestyle PA is the daily accumulation of at least 30 minutes of self-selected activities, which includes all leisure, occupational, or household activities that are at least moderate to vigorous in their intensity and could be planned or unplanned activities that are part of everyday life” (Dunn, Andersen, & Jackicic, 1998, p. 399).

As the multidimensional nature of the term, it is operationally defined as the impact of different elements of PA (type, frequency, duration, and intensity) on health in OKAs. Frequency and duration describe the number of times (usually each week) that the activity is undertaken and the total time spent in PA during the same period. Intensity is usually reported in terms of light, moderate, and vigorous activity by assigning a measure of intensity or relative energy expenditure (called metabolic equivalents or 'METs') to each activity category (American College of Sports Medicine [ACSM], 1998). One MET represents a person’s energy expenditure while quietly sitting at rest; it represents 3.5 ml of oxygen uptake per kilogram of body weight per minute and can be expressed in ml/kg/min or 1 kcal/kg/hour (Ainsworth et al, 2000).

Activities listed in the compendium of Ainsworth et al range from a MET intensity level or relative energy expenditure of 0.9 (sleeping) to 18 (running at 10.9 mph) and are calculated using the formula: kcal/week = METs x hours/week x weight in kilograms (Ainsworth et al, 2000). Summary scores can be expressed total kilocalories expended in

PA over a given time period, or expressed as categorical scores of sedentary (no reported PA), low (some activity but < 800 kcal/week), moderate (> 800 kcal/week), or high (at least 1,600 kcal/week and an hour of vigorous activity). This category is used for logistic regression analysis. Classification of the MET intensity of PA also can be divided into three groups: light (< 3 METs), moderate (3-6 METs), and vigorous (> 6 METs). The public health minimum recommendation for being active to obtain health benefits is moderate-intensity PA (US Department of Health and Human Services [DHHS], 2001). Moderate-intensity PA is activity performed at 55% to 70% of one's maximal heart rate, enough to expend approximately 200 calories per day, and the equivalent of brisk walking at 3 to 4 mph for healthy adults (Pate et al., 1995).

Health benefits of physical activity: Physical activity is one of the leading health indicators (US DHHS, 2001). The Centers for Disease Control and Prevention (CDC), the 1996 Surgeon General's Report, and the ACSM (1998) encourage all adults to participate in 30 minutes of moderate PA on most, if not all, days of the week (i.e., > 5 days a week). The benefits from regular PA in older adults include minimizing biological changes relating to aging, reversing disuse syndromes, control and improvement of chronic diseases, maximizing psychological health, increasing mobility and function, and assisting with rehabilitation from acute and chronic illness (ACSM, 1998; US DHHS, 1996). Increasing PA may help prolong health and preserve the quality of life in late adulthood (Kaplan, Newsom, McFarland, & Lu, 2001; Stewart, Mills, King, Haskell, Gillis, & Ritter, 2001). Some cross-sectional studies show that PA has a strong positive association with cognitive function, and even suboptimal adherence to moderate-intensity exercise can yield health benefits (Clark, Stump, & Damush, 2003).

Barriers to physical activity: The benefits of regular PA in older adults are well known (ACSM, 1998). Yet, one in three older adult men and one in two older adult women do not exercise at all (US DHHS, 1996), less than 30% of older adults are sufficiently active to achieve the full range of health benefits (Clark, 1999), and 70% to 80% of older women have lower levels of PA than the recommended public health standards (Buchner, 1997; Lee & Shinkai, 2003; US DHHS, 2001). Less than 10% of Korean elders are engaged in regular PA (Park & Han, 2003), and only 17% of adults in Korea exercise more than two times per week (Shin, Jang, & Pender, 2001). Therefore, there is a need to find safe and effective ways to encourage older people to become physically active.

Commonly identified barriers to physical activity for older adults are lack of energy, poor nutrition, poor vision, poor balance and muscle strength, chronic illness, deconditioning due to sedentary lifestyle, fear of injury or falling, lack of motivation, lack of skill, environmental factors (weather, extreme temperature, presence or quality of sidewalks, no place to sit down during a walk, lack of safe neighborhood, lack of transportation to a safe exercise facility), and low income (Bennett, 2002; Brawley, Rejeski, & King, 2003; King, Castro, Wilcox, Eyler, Sallis, & Brownson, 2000; Resnick & Pasco, 1998; Schroeder, Nau, Osness, & Potteiger, 1998). Growing evidence indicates differences for older adult subcultures and subcultural differences in language, ethnicity, education, and income are challenges to increase physical activity (Clark, 1999; Hays & Clark, 1999; King et al., 2000; King, Rejeski, & Buchner, 1998). From the review of literature, the conceptual framework for this study was developed (see Figure 1).

The purpose of this study is to describe the current level of PA and to explore

whether the biologic factors (gender, age, and body mass index [BMI]), sociocultural factors (education, income, marital status, and social support), and cognitive and affective factors (perceived health status, self-efficacy, and depression) are related to the PA level.

DESIGN AND METHODS

This is a cross-sectional study with convenience sampling. The data collection began December 2004 and ended July 2005. 151 Subjects were recruited from two senior centers and six retirement apartments located in San Francisco Bay Area through announcements at gathering sites, posting flyers in prominent locations, telephone contact, individual interactions, and word-of-mouth. The people who are either active or sedentary, 65 years of age or older, ambulatory, community-dwelling, and literate Korean-Americans were eligible. This study excluded subjects with the presence of debilitating conditions such as severe cognitive impairment, any severe musculoskeletal problem that would make habitual exercise not possible, metastatic cancer, crippling arthritis, severe Parkinson's disease, major stroke, or profound visual deficits that can compromise balance or ambulation. For screening and identification of health problems relating to PA that OKAs may have, possible health problems (arthritis, cancer, heart problem and medical history, diabetes, high blood pressure, breathing problems, mental health problems, stroke, Parkinson's disease, low back pain, knee problem, and others) were asked with yes or no response indicating how much the problem bothers the participant.

MEASUREMENTS

All instruments were prepared in Korean. Age, gender, income, education, religion, marital status, living environment, and health behavior were ascertained. The weight and

height were measured by calibrated scales and used to calculate BMI. BMI is a value that adjusts for body weight for lean body parts such as skeleton, organs, and muscle mass (Porter, Shafer, & Bohi, 1988). BMI of weight (kg)/height² (m) is used as an index of adiposity with “ideal” BMI range of 20-25 (Gibson, 1990).

Physical activity: Community Healthy Activities Model Program for Seniors (CHAMPS) Activities Questionnaire was administered by face-to-face interview for PA. The CHAMPS was developed as a lifestyle program considering personal choice and CHAMPS questionnaire was used in the intervention studies (Stewart, Mills, King, Haskell, Gillis, & Ritter, 2001; Stewart, Verboncoeur, et al., 2001). A Korean version did not exist, thus needed to be translated and back-translated process.

The 41-item CHAMPS questionnaire provides respondents with a comprehensive list of various light, moderate, and vigorous physical activities to which respondents report their weekly frequency of participation and weekly duration for a typical week over the last 4 weeks (Stewart, Mills et al, 2001). Scoring of the CHAMPS questionnaire yields four measures: estimated kcal and frequency per week spent in moderate-intensity (or greater) activities, and estimated kcal and frequency per week spent in “all” physical activities. For each participant, the total energy expenditure per week for physical activity was calculated. The energy expenditure for each activity was calculated according to the following formula: kcal/week = METs x hours/week x weight in kilograms (Ainsworth et al, 2000).

Moderate-intensity activities are defined as those with an intensity of three METs or greater and include walking briskly, jogging, dancing, golfing without using a cart, singles and doubles tennis, riding a stationary cycle or bicycle, swimming, water

exercises, aerobics, heavy household chores, and gardening. The “all activities” category includes the above plus walking leisurely, golfing with a cart, light housework, yoga, stretching/flexibility exercises, and general conditioning exercises (Stewart, Mills et al., 2001). In the CHAMPS Questionnaire for older adults, the correlations of the caloric expenditure are measured per week. The 2-week test-retest reliability for CHAMPS caloric expenditure measure for all listed physical activities is 0.66, and for moderate and greater intensity activities is 0.67. Several tests of construct validity were conducted, and sensitivity to change was analyzed based on response to the CHAMPS intervention. (Stewart, Verboncoeur et al, 2001). In our study, we calculated sum caloric expenditure per week from 28 out of 41 items for all activities and used 1109 kcal/week (median value of central tendency) as a cut-point because the distribution were skewed to the left. Scores ≥ 1109 were considered as higher energy expenditure.

Social support: Enhancing Recovery in Coronary Heart Disease (ENRICHD) social support inventory (ESSI) was used in this study. The investigators for ENRICHD study developed a 7-item instrument for assessing social support and compared scores on this instrument with other widely used self-report measures to determine the overlap with these existing scales in measuring emotional support, instrumental support, and social networks (Berkman et al., 2003; Mitchell et al., 2003). The 7-item ESSI scale was developed by identifying items regarding structural (partner), instrumental (tangible help), and emotional (caring) support; and elements that represented perceptions of low instrumental support, particularly low emotional support, rather than deficiencies in network structure (e.g., size, living arrangements) were selected based on the salience of instrumental and perceived emotional social support used in study of patients with

coronary heart disease (Berkman et al., 2003; Mitchell et al., 2003).

The categories ranged from 1 (none of the time) to 5 (all of the time), with item 7 scored 4 for yes and 2 for no. Internal consistency is acceptable because Cronbach alpha coefficient is 0.86. After dropping item 4 (instrumental support) and 7 (living alone), the standardized coefficient was improved, and then the distribution of a 5-point instrument was evaluated. This 5-item (Cronbach alpha coefficient=0.87) ranged from 5 to 25, with 18 and lower representing the low social support. It took 5 minutes to complete and there were no differences in completion time by gender, education, or ethnicity (Mitchell et al., 2003).

This instrument was translated and back-translated into Korean by Sohn et al (2005) and was completed with ease in a study of smoking behavior in hospitalized patients in Korean men (Cronbach's $\alpha = 0.78$). Also, a Chinese version of this instrument was also used by Li et al (2004). The Chinese version of ESSi worked very well for Chinese immigrant population living in California (Cronbach's $\alpha = 0.91$). The investigator modified one item, the wording about "emotional support" to obtain linguistic equivalency since Chinese people do not usually say emotional support, so the investigator modified one item as follows: How much of the time is someone available to you to provide with support (talking over problems or helping you make a difficult decision)? The original question in English version is "Can you count on anyone to provide you with emotional support for talking over problems or helping you make a difficult decision?" For this study, Cronbach's α was 0.85. The range was 9-34 in this sample and mean number 26 was used for the analysis as a cutoff point. Scores 26 and more were considered as high social support.

Acculturation: The Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA): The SL-ASIA has been widely used to measure an Asian American's level of acculturation and identity to the US. The scale consists of 21 multiple-choice questions, which contain topics related to language preference, identity, friendship choice, behaviors, generational/geographic background, and attitudes (Suinn, Richard-Figueroa, Lew, & Vigil, 1987). Responses are scored on a 5-point Likert scale from 1 (very Asian) to 5 (very Anglicized), with higher scores reflecting greater acculturation to American society. Possible scores range from 21 to 105. Suinn et al. (1987) referred to low, medium, and high scores on the scale as Asian-identified, bicultural, and Western-identified Asians, respectively. However, they provided no clear cutoff points for classification on this continuum. Usually, those participants scoring in the bottom third on the SL-ASIA are identified as low-accultured Asian Americans, scoring in the middle range are classified as bicultural, and the highest scored participants are categorized in the high-accultured group (Tsai & Pike, 2000). They reported a Cronbach's alpha of .91. Concurrent validity was tested using demographic variables, and the correlations ranged from .41 to .61 (Suinn et al., 1992). The authors also used three individual items on the scale as criteria for validating the overall instrument; they reported a direct relation between scores on the SL-ASIA and generation since immigration, length of residence in the United States, and self-ratings of cultural identity (Tsai & Pike, 2000).

This instrument was translated and back-translated into Korean by Kim and Chan (2004). Six factors believed to be important in determining acculturation were included in a 17-item scale. They were language (six questions: spoken at work and/or at home, written, thought, obtained when a child, spoken with friends), media use (three questions: television, radio, media preferred), friendship (four questions: close friends,

social gathering preference, friends preferred, offspring's friends), foods (two questions: food preference at home and at a restaurant), pride (one question) and ethnic self-identity (one question). Each question was rated on a scale ranging from very Korean (1) to very American (5). A higher score indicated a higher level of acculturation.

Reliability of modified Korean SL-ASIA scale was high (Cronbach's alpha= 0.92). For our study, Cronbach's alpha was 0.76. The range was 1-3.35 in this sample and mean number 1.4 was used for the analysis as a cutoff point. Scores ≥ 1.4 were considered as highly acculturated.

Perceived health status: A two-item measure, based on the Medical Outcome Study short-form 36-item (MOS SF-36) developed by Ware and Sherbourne (1992), was used to assess perceived health status. The participants were asked: What is your perception of your current health status? and What is your present health status compared to others of your own age? A 5-point response format was used. Scores were computed by adding up scored values from individual questions and lower scores represented a greater degree of health perception. The first item is self-rated with choices ranging from 1 (excellent) to 5 (very poor). The response choices for the second item range from 1 (much better than others) to 5 (much worse than others). The range for the first item was 1-5 in this sample and cutoff point for the analysis was good and excellent versus very poor/poor/fair.

Self-efficacy: Exercise self-efficacy scale is an 18-item tool. The participants recorded the strength of their confidence on a 100-point scale ranging in 10-unit intervals (0=not at all that I can do, 50=moderately certain can do, 100=totally confident that I can do) with a unipolar scale. Participants rated themselves from 0 to 100% how confident

they were that they could perform regular exercise when faced with the various circumstances known to impede exercise participation. For older adults, internal consistency was strong (Cronbach's $\alpha=0.92$) and the construct validity accounted for 30% of the variance in exercise (Resnick & Jenkins, 2000).

This instrument was translated and backward translated into Korean by Shin and colleagues (2001). There was an effort to select words that were easier to understand and yet be consistent with the original intent of the measure. An expert Korean panel (15 chronic disease adults, 3 nursing faculty members, 1 nursing postdoctoral fellow, and 1 nursing doctoral student) reviewed each item and assessed the appropriateness of translation for comprehension; then, awkward translations were changed into free translation (Shin et al., 2001).

Psychometric testing of the scale in Korean version was conducted by Shin et al (2001); internal consistency was very high (standardized Cronbach alpha coefficient =0.94); the correlation coefficient for 2-week test-retest reliability was 0.77, indicating this scale is relatively stable; and face validity was evaluated and ascertained by the same expert panel. The results of factor analysis in Korean adults with chronic disease formed a single factor, consistent with Bandura's original exercise self-efficacy scale, and explained 77.5% of the variance (Shin et al., 2001). For our study, Cronbach's alpha was 0.97. The range was 0-100 in this sample and cutoff point for the analysis was 70 based on previous studies. Scores 70 and more were considered as higher self-efficacy.

Depression: The Geriatric Depression Scale (GDS) was designed to rate depressive symptoms in the elderly and was reliable and valid in this population (Yesavage, Brink, & Rose, 1983). This is 30-item questionnaire with yes or no response

choices. The GDS has excellent reliability and validity (test-retest reliability = .85; internal consistency = .94). Scores can range from 0 to 30, with higher scores indicating more depressive symptoms. Scores of 0 to 9 are normal, scores of 10 to 19 yield a sensitivity of 84% and a specificity of 95% for mild depression in elders, and scores of 20 to 30 yield a sensitivity of 80% and a specificity of 100% for severe depressive symptoms (Osterweil, Brummel-Smith, & Beck, 2000). One of the strengths of GDS is that it contains no somatic items that can introduce age bias into the depression screening scale by inflating total scores among the elderly population who may have several chronic conditions (Mui, 1996). Content and face validity of the GDS Korean version (GDS-K) were established and found to be reliable (Cronbach's alpha = .83) instrument for the Korean elders (Kang & Kim, 2000). For our study, Cronbach's alpha was 0.84. The range was 0-26 in this sample and cutoff point for the analysis was 10 based on previous studies. Scores of 10 and more were considered as having depressive symptoms.

DATA COLLECTION AND ANALYSIS

Approval for this study was obtained from the Committee on Human Research (CHR) at the University of California, San Francisco (UCSF). Study procedures were described to potential subjects, and they were asked to sign a consent form for participation in the study. All forms were reviewed for accuracy and completeness at the time of data collection. Each participant was interviewed to complete the questionnaires.

Statistical Package of Social Sciences (SPSS, version 12.0) program was used to conduct the statistical data analysis. Descriptive statistics such as frequency and distribution of variables were used to evaluate data entry errors and any discrepancies

were verified with the original, raw data. To describe the study population and their PA, actual numbers for frequency, mean with standard deviation (SD), median with ranges and proportion were used. All continuous data (physical activity, income, age, BMI, health problems, social support, acculturation, self-efficacy, and depression) were expressed as mean (\pm SD). Median values were used for data that showed skewed distribution. Chi-square tests were performed to describe the demographic profile by gender. To examine the correlation between perceived health status, acculturation, exercise self-efficacy, depression, education, income, marital status, social support, gender, age, BMI, health problems, and physical activity level, Pearson's correlations were used. The level of significance for all analyses was set at a p value less than .05 (two-tailed).

Variables identified as significant in univariate analysis were used in multiple regressions to estimate their independent contribution to predict physical activity in OKAs. An exploratory logistic regression model was tested using a set of biologic variables, a set of sociocultural variables, and a set of cognitive and affective factors to determine their independent contributions on physical activity (> 1109 cal/week or ≤ 1109 cal/week).

RESULTS

122 females (80.8%) and 29 males (19.2%) participated in this study from the six senior apartments and two senior service centers in San Francisco Bay Area. Descriptive statistics for total sample, men, and women are shown in Table 1. The mean age was 77.51 (± 6.41) and the average length of staying in America was 20.11 (± 7.85). Most are Protestant (82.8%). 60% of them were widowed and live alone. 63% of the subjects completed elementary or middle school. Their average annual income was \$ 9,161.8 (\pm

3,267.5). Major self-reported health problems (See Table 2) are Hypertension (63.6%), Low back pain (54.3%), and Knee problem (52.3%). Table 1 shows that women in our study were more likely to be widowed or living alone ($\chi^2=0.45$, $p < 0.01$), were less educated ($\chi^2=0.26$, $p < 0.01$), perceived their health to be lower ($\chi^2=0.22$, $p < 0.05$), had less depressive symptoms ($\chi^2=0.22$, $p < 0.05$), reported fewer health problems ($\chi^2=0.32$, $p < 0.01$), and were less active ($\chi^2=0.26$, $p < 0.01$) than men.

Table 3 shows that 67% of the total subjects (71.3% of women and 48.3% of men) were less active than current public health recommendations in terms of frequency. The caloric expenditure per week in all listed physical activities was 1530.3 (\pm 1478.9), and median was 1108.7. For caloric expenditure per week in at least moderate intensity physical activities, the range was 0-6966, mean was 619.4 (\pm 1025.2), median was 112.3 (skewed distribution to the left), but there was no gender difference ($\chi^2=0.20$, $p > 0.05$). The frequency per week in all listed physical activities, the range was 0-75, mean was 15.2 (\pm 10.3), median was 14, but there was no gender difference ($\chi^2=0.02$, $p > 0.05$). For frequency per week in at least moderate intensity physical activities, the range was 0-65, mean was 4.3 (\pm 7.2), median was 1, and women were less frequently engaged in at least moderate intensity physical activities ($\chi^2=0.19$, $p < 0.05$).

In Table 3, 44% of subjects (31.0% of older Korean-American men and 47.5% of older Korean-American women) did not exercise at all at a moderate intensity physical activity level. Less than 27.8% of OKAs are sufficiently active to achieve the full range of health benefits. 50% of subjects did not exercise more than one times per week in at least moderate intensity physical activities. 75.4% of older Korean-American women have low levels of caloric expenditure for moderate and greater PA.

A Pearson correlation matrix (See Table 4) was performed to examine variable for their potential association with self-reported physical activity. Hypotheses were generally supported. In OKAs; men were more active than women ($r = 0.34, p < 0.01$); subjects who had more health problems were less engaged in physical activity ($r = -0.27, p < 0.01$); well-educated subjects were more engaged in physical activity than lower-educated subjects ($r = 0.29, p < 0.01$); subjects who had strong social support were more engaged in physical activity than those with weak social support ($r = 0.19, p < 0.05$). Highly acculturated subjects were more engaged in physical activity than less acculturated subjects ($r = 0.17, p < 0.05$); The better subjects perceive their health, the more they were engaged in physical activity ($r = 0.27, p < 0.01$); Subjects who had a strong exercise self-efficacy were more engaged in physical activity than subjects who had low exercise self-efficacy ($r = 0.27, p < 0.01$); Subjects who had more depressive symptoms were less engaged in physical activity than those with lower depressive symptoms ($r = -0.18, p < 0.05$). Age, income, marital status, and BMI were not associated with physical activity in this population of OKAs.

Multiple linear regressions were conducted including specific factors for being physically active in OKAs (See Table 5). Overall, approximately 26% of total variability in physical activity in the sample of OKAs could be explained by the significant eight variables in this model ($R^2 = 0.261, F_{8, 142} = 6.257, p < 0.01$). Gender, social support, and self-efficacy were robust and significantly related to physical activity in OKAs. A multiple regression model revealed that R^2 is increased significantly and approximately 6%, 2%, 3%, 7%, and 5 % of total variances in physical activity could be explained additionally by gender (R^2 change=0.063, $F_{8, 142} = 12.03, p < 0.01$), social support (R^2 change=0.024, $F_{8, 142} = 4.44, p < 0.05$), self-efficacy (R^2 change=0.031, $F_{8, 142} = 5.97, p < 0.05$), biological factors (R^2

change=0.069, $F_{2, 142}=6.62$, $p < 0.01$), sociocultural factors (R^2 change=0.069, $F_{3, 142}=4.40$, $p < 0.01$), and cognitive and affective factors (R^2 change=0.048, $F_{3, 142}=3.08$, $p < 0.05$), respectively, holding the other variables constant.

Logistic regression analysis (See Table 6) were conducted separately for a set of biologic variables (gender, health problems), for a set of sociocultural variables (education, social support, acculturation), and for a set of cognitive and affective factors (perceived health status, self-efficacy, depression) to estimate OR with 95% CI of selected subsets of factors to determine their independent contributions to being physically active (the hypothesized model). Two out of eight variables, gender (OR=3.33, 95% CI=1.18, 9.43) and self-efficacy (OR=1.02, 95% CI=1.01, 1.04), provided statistically significant estimates. Social support showed borderline significance (OR=1.03, 95% CI=0.98, 1.09). When logistic regression was repeated (See Table 7) with these three variables, gender (OR=4.07, 95% CI=1.54, 10.74) and self-efficacy (OR=1.02, 95% CI=1.01, 1.03) provided statistically significant contribution independently but social support still showed borderline significance (OR=1.04, 95% CI=0.99, 1.10).

DISCUSSION

This is the first study to investigate the association between biological, sociocultural, and cognitive/affective factors and PA in OKAs. While the benefits of PA have been well documented, less is known about the barriers that are associated with maintaining PA or changing behavior from sedentary to active lifestyle among older adults. This study contributes empirically derived data on the factors that are associated with regular PA in OKAs.

All adults need to participate in 30 minutes of moderate PA on most, if not all, days of

the week (i.e., > 5 days a week) to get health benefits (ACSM, 1998; US DHHS, 1996, 2001). Similar to other population, 67% of OKAs were less active than the recommended public health standards in our study. The public health minimum recommendation to obtain health benefits is moderate-intensity PA that enough to expend approximately 200 calories per day, and the equivalent of brisk walking at 3 to 4 mph for most healthy adults (Pate et al., 1995; US DHHS, 2001). Yet, 44 % of subjects (31% of older Korean-American men and 48% of older Korean-American women) in our study did not exercise at all in at least moderate intensity physical activities. Less than 28% of OKAs are sufficiently active to achieve the full range of health benefits and 50% of subjects did not exercise more than one time per week at a moderate intensity PA level. The preferred PA in our sample was walking. Therefore, there is a need to find safe and effective ways to encourage OKAs to become physically active and get health benefits from engaging in regular moderate intensity PA.

Subcultural differences in language, ethnicity, education, and income are challenges to increase physical activity (Clark, 1999; Hays & Clark, 1999; King et al., 1998, 2000). Similar to other ethnic elders, OKAs are inactive. Income, education, and marital status had contributed to decline in functioning for older Caucasian men (Strawbridge, Camacho, Cohen, & Kaplan, 1993); lower education, being male, higher BMI, and older age were associated with lower level of habitual PA in older Mexican Americans (Mouton, Calmbach, Dhanda, Espino, & Hazuda, 2000). Some studies show older women are more sedentary than older men (Lee & Shinkai, 2003; USDHHS, 2001), but other studies did not confirm this finding (Mouton et al., 2000; Sohng et al, 2002; Stewart et al, 2003). In our study, older Korean-American women were less active than older Korean-American men. Gender, social

support, and exercise self-efficacy were the most significant factors related to PA among OKAs. 81% of the subjects in our study had low exercise self-efficacy. Throughout the analysis, self-efficacy was a robust measure related to PA and it was consistent with other studies.

In our study population, BMI tended to be in normal range by using western criteria. The WHO (2004) has recommended lower cutoff points of BMI for Asians due to their smaller bone structure (Pan, Flegal, Chang, Yeh, Yeh, & Lee, 2004; WHO, 2004). Using the Asian standards for BMI, the results of the association between BMI and PA in OKAs need to be reassessed.

Unlike other studies, men had more depressive symptoms and reported more health problems than women in our study. Having more health problems can be a reason why men had more depressive symptoms than women in our study. Consistently, 55% of men in our study perceived their health to be lower. The interviewer impressed that older Korean-American women are more involved in activity at church and socialized than older Korean-American men. That can be another reason for explaining less depressive symptoms in older Korean-American women although 79.5% of them perceived their health to be lower.

The salient findings of this study are three: first, we provide a careful and detailed description of the physical activity levels of OKAs along with factors that show associations with physical activity practices; second, it is of note in this sample of OKAs, the average length of staying in the US was 20 years; yet, their level of acculturation was still low; third, most subjects acknowledged anecdotally having difficulty in their communications because they had not spoken English before they came to America, and could still not speak, read, and write in English at all. Even

after entered the US, they usually stayed at home to take care of their grandchildren or to do housework. Thus, a language barrier was the most important limitation to their life in America.

This was a cross-sectional study of PA in OKAs; limitations inherent in a cross-sectional study preclude firm causal statements due to lack of a temporal sequence and the potential survival and mobility bias. Additionally, the convenience sampling method we used as well as the study inclusion and exclusion criteria may have resulted in selection bias. Recall bias could be a problem since participants were asked to report physical activity in a typical week over the past 4 weeks.

The subjects were a convenience sample recruited from the San Francisco East Bay area, so generalizability of results might be limited to California OKAs. Future studies with need to be planned with adequate funding to verify our results with a random sample of OKAs. Since physically active individuals would more likely to be active in public facilities such as senior centers, and get information about this study; thus, they are more likely to be included in the study sample. While the study aimed to recruit both older men and women, few men were enrolled. This may in part be due to the demographic distribution and life expectancy statistics that women live longer. Consequently, any results about OKA men must be interpreted with caution.

An important limitation of this study was the self-report measure of physical activity. Self-report measures verified with mechanical measure such as accelerometers and pedometers would yield more precise information. To its credit, the CHAMPS questionnaire measured intensity, frequency, and duration of physical activity, which is an improvement over many self-report measures that assess only exercise frequency. However, subjects

encountered difficulties in filling out the tools by themselves except for few college-leveled subjects. Also, the options for duration in CHAMPS activity questionnaire has 120 minutes gap in choices of categories such as 2.5-3 hours, 4.5-5 hours, 6.5-7 hours, and 8.5-9 hours. Another limitation of this study is its use of two items to measure perceived health status because a multiple-item assessment would allow researchers to estimate internal consistency.

The strengths include: First, this is the first study that addressed OKA, by a gerontological nurse, who is bicultural and bilingual and was able to appreciate the issues of this population in a culturally sensitive manner, this eliminating cultural and language barriers. Second, to minimize potential mobility bias from this sample, the investigator visited retirement apartments to recruit sedentary or inactive OKAs. In addition, the author obtained a roster from facilities or other information sources such as Korean-American Community network and then called subjects on the roster to recruit subjects from a broader physical activity population. Third, all questionnaires in this study were administered by face-by-face interview and the interviewer made notes for obtaining actual duration of each activity to compensate the 120 minutes gaps in CHAMPS activity questionnaire.

Conclusion

Physical activity is generally understood to benefit overall health by increasing energy and strength, improving physical and psychological well-being, and preventing illness. Based on our results, few strategies are recommended for PA in OKAs. The first is to help reinforce the importance of PA to increase self-efficacy and empower health care providers to be advocates and role models for OKAs' PA. Next, focusing on the social support including family members or friends, who are frequently seen and most influential in promoting the OKAs' PA, would seem most

effective. Third, using Korean-speaking television and radio channels would be efficient for the campaign message regarding health benefits of regular PA and public health recommendations. In addition, community involvement of health care providers and community leaders is essential to highlight the problem of sedentary or inactive life style and to provide PA intervention in Korean.

This cross-sectional study is the first step toward a better understanding of the health issues in OKA's. Our results add to the science of physical activity and help understand factors that contribute to participate in PA among OKAs. This information can guide future intervention studies to promote and maintain physical activity in Korean-Americans.

Based on our results, there are several suggestions. Future studies need to be planned with adequate funding to verify our results with a random sample of OKAs. There is a strategy to obtain equal size of male and female sample then compare the results by gender. In-depth interview is needed to understand and explain why OKAs are inactive. More studies that focus on intrapersonal, interpersonal, & social system relationships are needed to initiate & maintain PA behavior in OKAs.

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Figure 1. Conceptual framework for this study

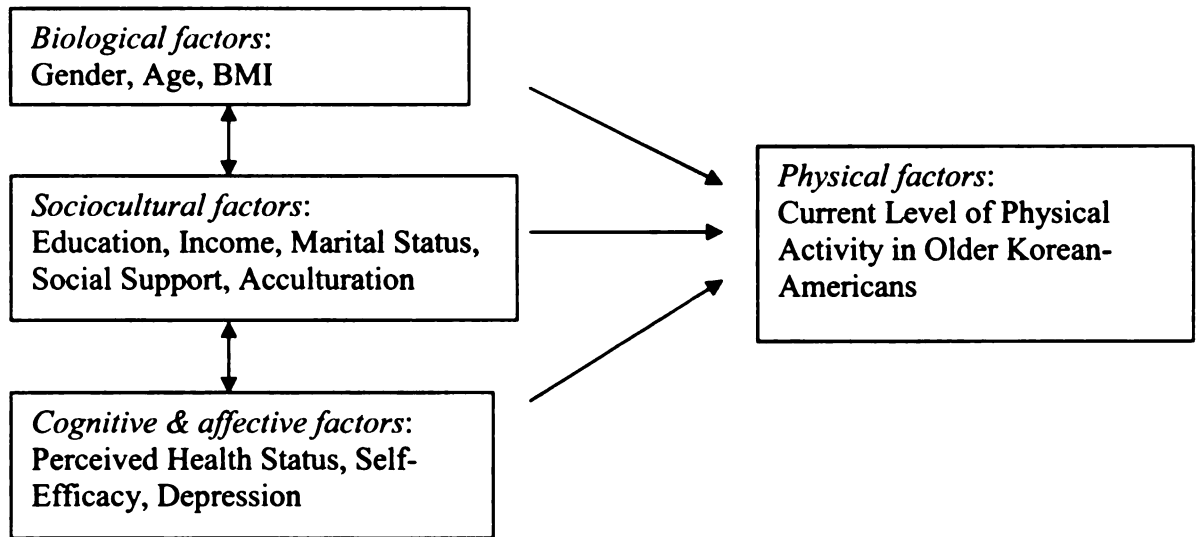


Table 1. Demographic Profile by Gender (n=151)

Variables	Gender			Range	Mean (\pm SD)	χ^2	P	
	Female % (n=122)	Male % (n=29)	Total % (n=151)					
Age	65-74	36.9	27.6	35.1	65-93	77.5 (\pm 6.4)	.11	.38
	75-84	44.3	58.6	47.0				
	\geq 85	18.9	13.8	17.9				
BMI	Underweight (<20)	5.7	6.9	6.0	16.9 - 34.3	25.3 (\pm 3.5)	.13	.44
	Ideal weight (20-25)	44.3	27.6	41.1				
	Overweight (>25 -30)	42.6	55.2	45.0				
	Obese (>30)	7.4	10.3	7.9				
Education	< High school	68.9	37.9	62.9			.26	.00*
	\geq High school	31.1	62.1	37.1				
Marital Status	Widowed/Separate/Divorced	69.7	17.2	59.6			.45	.00*
	Married	30.5	82.8	40.4				
Religion	Christian	85.2	72.4	82.8			.13	.09
	Buddhism/None/Others	14.8	27.6	17.2				
Years in America	1-9 years	9.8	13.8	10.6	1-36	20.1 (\pm 7.9)	.13	.48
	10-19 years	27.0	37.9	29.1				
	20-29 years	45.9	31.0	43.0				
	\geq 30 years	17.2	17.2	17.2				
Annual Income	\$ 0 - 9,840	90.2	100	92.1	\$ 0 - 28,800	\$ 9,161.8 (\pm 3,267.5)	.14	.07
	> \$ 9,840	9.8	0	7.9				
Social Support	Low (< 26)	36.9	37.9	37.1	9-34	26.5 (\pm 7.0)	.01	.54
	High (\geq 26)	63.1	62.1	62.9				
Accultura- tion	Low (< 1.4)	59.0	48.3	57.0	1-3.35	1.4 (\pm 0.4)	.09	.20
	High (\geq 1.4)	41.0	51.7	43.0				
Perceived Health	Very poor/Poor/Fair	79.5	55.2	74.8	1-5	3.1 (\pm 1.0)	.22	.01*
	Good/Excellent	20.5	44.8	25.2				
Self Efficacy	Low (< 70)	82.8	72.4	80.8	0-100	38.3 (\pm 29.3)	.10	.16
	High (\geq 70)	17.2	27.6	19.2				
Depressive syptoms	Low (< 10)	55.7	27.6	50.3	0-26	11.3 (\pm 5.9)	.22	.01*
	High (\geq 10)	44.3	72.4	49.7				
Health Problems	Low (\leq 3)	50.8	10.3	43.0	0-9	3.2 (\pm 2.1)	.32	.00*
	High (> 3)	49.2	89.7	57.0				
Caloric expenditure : All ⁺⁺	< 1109 ⁺ kcal per week	56.6	24.1	50.3	0- 8954.2	1530.3 (\pm 1478.9)	.26	.00*
	\geq 1109 kcal per week	43.4	75.9	49.7				
Total		80.8	19.2	100				

⁺ Median number for all physical activities

⁺⁺ For caloric expenditure per week in at least moderate intensity physical activities, the range was 0-6965.9, mean was 619 (\pm 1025.2), median was 112.3, and it was not a statistically significant difference by gender ($\chi^2=0.11$, $p = 0.16$).

* $P < 0.05$

Table 2. Frequency of Self-reported Health Problems and Conditions by degree of “bothersome” (n=151)

Reported Health Problem+	%	Average “bothersome”[*] Mean (SD)
Cancer (n=6)	4.0	1.8 (1.1)
Heart Problem (n=32)	21.2	2.1 (0.9)
Diabetes (n=36)	23.8	2.0 (0.9)
Hypertension (n=96)	63.6	1.8 (0.8)
Stroke (n=3)	2.0	1.3 (1.5)
Parkinson’s Disease (n=2)	1.3	3.0 (0.0)
Breathing Problem (n=32)	21.2	1.7 (0.9)
Arthritis (n=65)	43.0	2.1 (0.9)
Osteoporosis (n=49)	32.5	2.1 (0.9)
Low Back Pain (n=82)	54.3	2.0 (0.9)
Knee Problem (n=79)	52.3	2.2 (0.8)
Mental Health Problem (n=4)	2.6	2.3 (1.0)

Note. + Not mutually exclusive

* The Response Options for bothersome are: 0=Not at all, 1=A little, 2=Some, 3=A lot

** Other self-reported health problems are: Stomach discomfort (19.2%, 29), Constipation (17.9%, 27), Eye discomfort (9.3%, 14), Cataract (27.2%, 41), Glaucoma (2.6%, 4), Leg cramping (1.3%, 2), High cholesterol (24.5%, 37), Ulcer (0.7%, 1), Ear problem (4.6%, 7), Dizziness (13.2%, 20), Thyroid Disease (2.0%, 3), Benign Prostatic Hypertrophy (0.7%, 1), Asthma (1.3%, 2), Urinary problem (0.7%, 1), and Tremor (0.7%, 1).

Table 3. Physical activity measures (n=151)

Measure	Gender			Range	Mean (± SD)	χ ²	P
	Female % (n=122)	Male % (n=29)	Total % (n=151)				
Caloric expenditure for moderate & greater physical activities ⁺	Sedentary, no report	47.5	31.0	44.4	0-6965.9	619.4 (± 1025.2)	.10
	Low (1 - ≤ 800)	27.9	27.6	27.8			
	Moderate (800- ≤ 1600) High (>1600)	13.9 10.7	13.8 27.6	13.9 13.9			
Frequency for moderate & greater physical activities	< 5 ⁺ per week	71.3	48.3	66.9	0-65	4.3 (± 7.2)	.02*
	≥ 5 ⁺ per week	28.7	51.7	33.1			
Frequency for moderate & greater physical activities	< 3 [#] per week	65.6	44.8	61.6	0-65	4.3 (± 7.2)	.04*
	≥ 3 [#] per week	34.4	55.2	38.4			
Caloric expenditure for all physical activities ⁺	Sedentary, no report	3.3	58.6	2.6	0-8954.2	1530.3 (± 1478.9)	.02*
	Low (1 - ≤ 800)	38.5	20.7	35.1			
	Moderate (800- ≤ 1600) High (>1600)	30.3 27.9	20.7 0	28.5 33.8			
Frequency for all physical activities	< 5 ⁺ per week	12.3	10.3	11.9	0-75	15.2 (± 10.3)	.77
	≥ 5 ⁺ per week	87.7	89.7	88.1			
Frequency for all physical activities	< 3 [#] per week	7.4	0	6.0	0-75	15.2 (± 10.3)	.13
	≥ 3 [#] per week	92.6	100	94.0			
Caloric expenditure for moderate & greater physical activities	< 112 ⁺⁺ kcal/week	52.5	37.9	49.7	0-6965.9	619.4 (± 1025.2)	.16
	≥ 112 ⁺⁺ kcal/week	47.5	62.1	50.3			
Frequency for moderate & greater physical activities	< 1 ⁺⁺ per week	53.5	37.9	50.3	0-65	4.3 (± 7.2)	.14
	≥ 1 ⁺⁺ per week	46.7	62.1	49.7			
Caloric expenditure for all physical activities	< 1109 ⁺⁺ kcal/week	56.6	24.1	50.3	0-8954.2	1530.3 (± 1478.9)	.00*
	≥ 1109 ⁺⁺ kcal/week	43.4	75.9	49.7			
Frequency for all physical activities	< 15 per week	58.2	41.4	55.0	0-75	15.2 (± 10.3)	.07
	≥ 15 per week	41.8	58.6	45.0			
Total		80.8	19.2	100			

⁺ New public recommendations for each measures # Old public recommendations for each measures ⁺⁺ Median number for each measures * Statistically significant at the 0.05 level (2-tailed)

Table 4. Correlations Between Study Variables (n=151)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Gender	-----												
2. Age	-.02	-----											
3. Education	.25**	-.04	-----										
4. Marital Status	.42**	-.20*	.12	-----									
5. Annual Income	-.19**	.10	.17*	-.08	-----								
6. BMI	.03	-.24**	-.18*	-.07	.01	-----							
7. Perceived Health Status	.22**	-.04	.28**	.05	-.04	-.13	-----						
8. Social Support	-.01	.01	.07	.26**	.04	-.08	.06	-----					
9. Acculturation	-.01	-.25**	.36**	-.07	.09	-.02	.08	-.03	-----				
10. Self-efficacy	.10	-.08	.05	.02	-.08	-.08	.34**	.13	-.04	-----			
11. Depression	-.16	.08	-.11	-.24**	.04	.15	-.27**	-.24**	.05	-.39**	-----		
12. Health Problems	-.33**	.07	-.24**	-.23**	.14	.30**	-.48**	-.15	-.10	-.31**	.41**	-----	
13. Physical activity: all	.34**	.09	.29**	.13	.03	.10	.27**	.19*	.17*	.27**	-.18*	-.27**	-----

* Statistically significant at the 0.05 level (2-tailed)

** Statistically significant at the 0.01 level (2-tailed)

*** Set criteria: <.30 weak correlation, .30-.69 moderate correlation, ≥ .70 strong correlation (From McHorney et al. 1993)

Table 5. Regression Analysis for Factors Associated with Physical Activity (n=151)

Source	R^2	B	95% CI ⁺	R^2 Change	df ⁺	F	p
Intercept		-1840.5	-3528.1, -153.0				
Biological Factors				0.069	2, 142	6.615	.002**
Gender**		1022.4	439.8, 1605.0	0.063	8, 142	12.034	.001**
Health Problems		-13.8	-140.0, 112.5	0.001	8, 142	0.046	.830
Sociocultural Factors				0.069	3, 142	4.395	.007**
Education		381.0	-119.3, 881.3	0.012	8, 142	2.265	.134
Social Support*		33.2	2.1, 64.4	0.024	8, 142	4.435	.037*
Acculturation		478.0	-68.1, 1024.1	0.016	8, 142	2.826	.095
Cognitive & Affective Factors				0.048	3, 142	3.084	.038*
Perceived Health Status		266.0	-324.1, 856.0	0.004	8, 142	0.870	.353
Self-efficacy**		10.1	2.0, 18.3	0.031	8, 142	5.973	.016*
Depression		3.7	-37.0, 44.3	0.001	8, 142	0.054	.817
Overall	0.261				8, 142	6.257	.000**

Note. Total model: $R^2=0.26$, $df=8$, $F=6.26$, $P < 0.05$; CI⁺=Confidence Interval df^+ = Degree of freedom

* Statistically significant at the 0.05 level (2-tailed) ** Statistically significant at the 0.01 level (2-tailed)

Table 6. Logistic Regression Analysis for Factors Associated with Physical Activity (n=151)

Factors	OR ⁺	95% CI ⁺⁺
Biological Factors		
Gender*	3.33	1.18, 9.43
Health Problems	0.95	0.77, 1.17
Sociocultural Factors		
Education	1.81	0.79, 4.15
Social Support	1.03	0.98, 1.09
Acculturation	1.27	0.52, 3.15
Cognitive & Affective Factors		
Perceived Health Status	0.61	0.23, 1.63
Self-efficacy**	1.02	1.01, 1.04
Depression	0.96	0.90, 1.03

Note. + Odds Ratio, ++ 95% Confidence Interval

* Statistically significant at the 0.05 level (2-tailed)

** Statistically significant at the 0.01 level (2-tailed)

Table 7. Logistic Regression Analysis for Significant Factors Associated with Physical Activity (n=151)

Factors	OR ⁺	95% CI ⁺⁺
Gender*	4.07	1.54, 10.74
Social Support	1.04	0.99, 1.10
Self-efficacy*	1.02	1.01, 1.03

Note. + Odds Ratio, ++ 95% Confidence Interval

* Statistically significant at the 0.01 level (2-tailed)

This is the first cross-sectional study to investigate the association between biological, sociocultural, and cognitive/affective factors and physical activity in older Korean-Americans. While the benefits of physical activity have been well documented, less is known about the barriers that are associated with maintaining physical activity or changing behavior from a sedentary to an active lifestyle among older adults. This study contributes empirically derived data on the factors that are associated with regular physical activity in older Korean-Americans.

A sample of 151 was recruited and participated in this study from the six senior apartments and two senior service centers in San Francisco Bay Area. 80.8% of these were females. Subjects were interviewed using the 41-item Community Healthy Activities Model Program for Seniors Activities Questionnaire, 2-item Perceived Health Status, 18-item Exercise Self-Efficacy Scale, 7-item Enriched Social Support Instrument, and 30-item Geriatric Depression Scale.

44.4% of subjects (47.5% of older Korean-American women and 31.0% of older Korean-American men) did not exercise at all in at least moderate intensity physical activities. 50.3% of subjects did not exercise more than one times per week in at least moderate intensity physical activities. 66.9% of the subjects (71.3% of women and 48.3% of men) were less active than public health recommendations in terms of frequency. 75.4% of older Korean-American women have lower levels of caloric expenditure than the recommended public health standards.

Men were more active than women ($r = 0.34, p < 0.01$). Subjects who had more health problems were less engaged in physical activity ($r = -0.27, p < 0.01$). Well-educated subjects were more engaged in physical activity than lower-educated subjects ($r = 0.29, p < 0.01$).

Subjects who had strong social support were more engaged in physical activity than those with weak social support ($r = 0.19, p < 0.05$). Highly acculturated subjects were more engaged in physical activity than less acculturated subjects ($r = 0.17, p < 0.05$). The better subjects perceive their health, the more they were engaged in physical activity ($r = 0.27, p < 0.01$). Subjects who had a high exercise self-efficacy were more engaged in physical activity than subjects who had low exercise self-efficacy ($r = 0.27, p < 0.01$). Subjects who had more depressive symptoms were less engaged in physical activity than those with lower depressive symptoms ($r = -0.18, p < 0.05$). Age, income, marital status, and body mass index were not associated with physical activity in this population of older Korean-Americans.

Gender, social support, and self-efficacy were robust measures and significantly related to physical activity in older Korean-Americans. Overall, a multiple regression model revealed that approximately 26% of total variability in physical activity in the sample of older Korean-Americans could be explained by the eight significant variables in this model ($R^2 = 0.261, F_{8, 142} = 6.257, p < 0.01$). A multivariate logistic regression analysis showed that gender [OR=3.33 (95% CI=1.18, 9.43)] and self-efficacy [OR=1.02 (95% CI=1.01, 1.04)], were robust and provided statistically significant association with physical activity; while social support was borderline significance [OR=1.03 (95% CI=0.98, 1.09)] with physical activity.

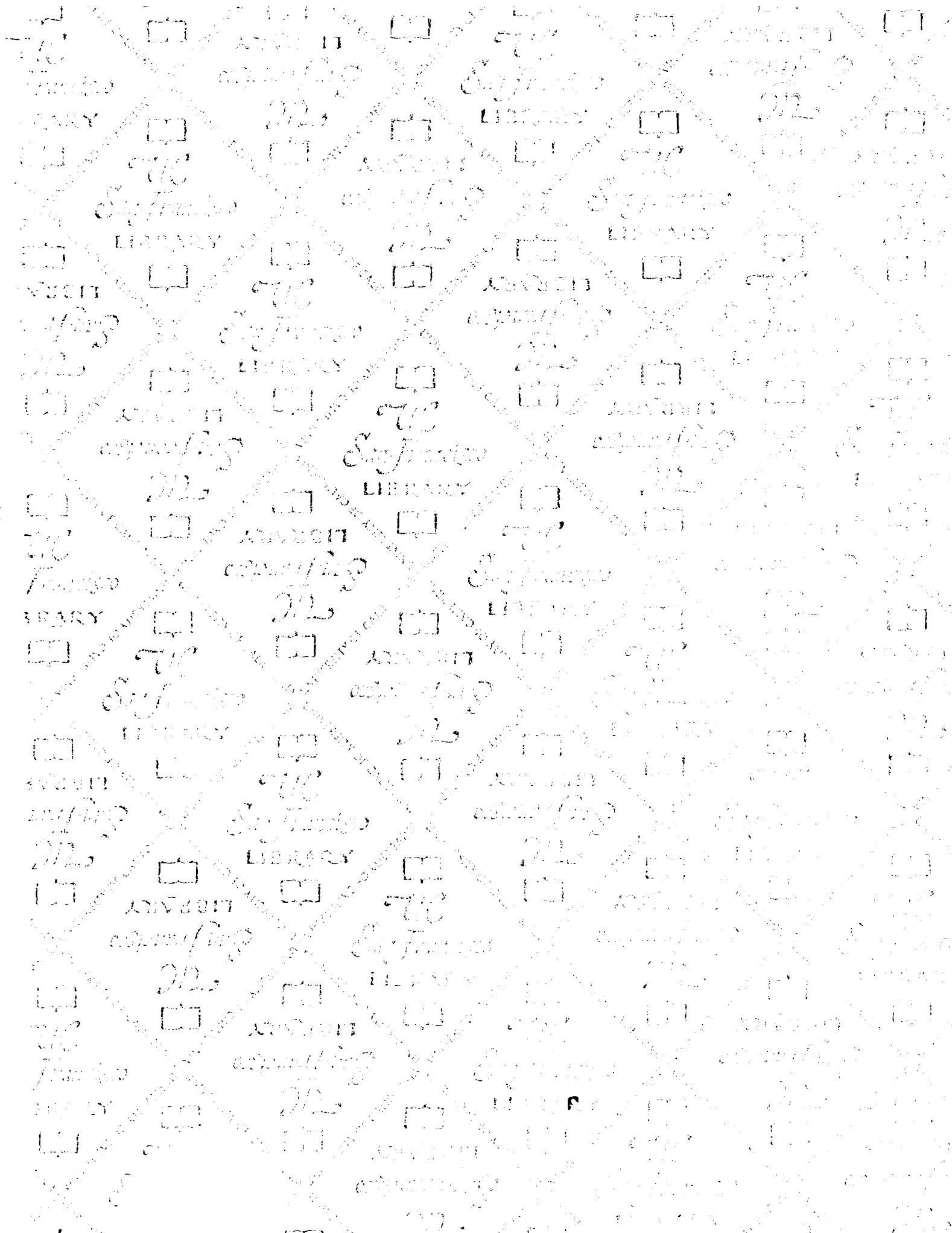
The salient findings of this study are three: first, we provide a detailed description of the physical activity levels of older Korean-Americans along with factors that are associated with physical activity practices; second, this sample of older Korean-Americans had on average lived for 20 years in the US; yet, their level of acculturation was low; third, most subjects acknowledged anecdotally having

difficulty in their communications. Thus, a language barrier was the most important limitation to their life in America including participation in physical activities.

This cross-sectional study may be the first step toward a better understanding of the health issues in older Korean-Americans. Our results add to the science of physical activity and help understand factors that contribute to participate in PA among older Korean-Americans. These findings can guide future intervention studies to promote and maintain physical activity in Korean-Americans.

Based on our results, there are several suggestions. Future studies need to be planned with adequate funding to verify our results with a random sample of older Korean-Americans. Strategies are needed to obtain equal size of male and female sample then compare the results by gender. In-depth interview is needed to understand and explain why older Korean-Americans are inactive. More studies that focus on intrapersonal, interpersonal, & social system relationships are needed to initiate & maintain PA behavior in older Korean-Americans.

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